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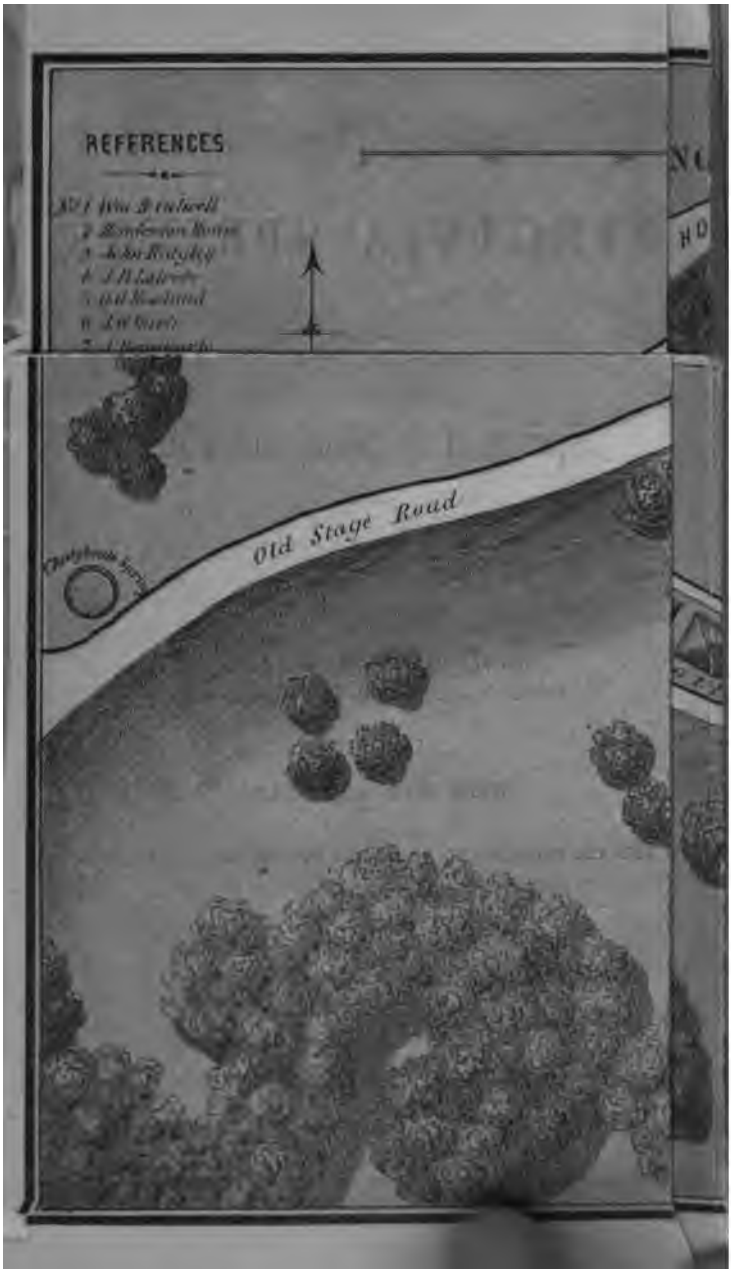
REFERENCES
Old Stage Road

THE

VIRGINIA SPRINGS,

AND

Springs of the South and West.

BY

J. J. MOORMAN, M.D.,

RESIDENT PHYSICIAN AT THE WHITE SULPHUR SPRINGS.

WITH MAP AND PLATES,

AND THE ROUTES AND DISTANCES TO THE VARIOUS SPRINGS.

PHILADELPHIA:

J. B. LIPPINCOTT & CO.

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TO

JOHN BELL, M.D.,

OF PHILADELPHIA,

WHO, MORE THAN ANY OTHER AMERICAN, HAS DEVOTED THE ENERGIES OF AN ACCOMPLISHED AND DISCRIMINATING MIND TO THE INVESTIGATION OF MINERAL WATERS,

This Volume

IS RESPECTFULLY DEDICATED,

IN GRATITUDE FOR HIS VALUABLE CONTIBUTION TO MEDICAL LITERATURE ON THAT IMPORTANT SUBJECT.

THE AUTHOR.

TO THE PUBLIC.

For more than twenty years I have directed special attention to the investigation of the nature and medicinal applicability of mineral waters. During this time, I have resided, throughout the watering season, at the White Sulphur Springs, where, in the character of Resident Physician, I have enjoyed ample opportunities of witnessing the various and modified effects of the water, in almost every variety of disease and state of the system.

Although my attention, during this time, has been especially directed to the investigation of the character of the water of that spring, I have not neglected the other valuable waters of the country, nor failed to appreciate their various peculiarities, and their relative and positive merits.

While the position of the author has enabled him to witness the virtues of our mineral waters in diseases, it has, at the same time, fully satisfied him not only that their good effects are often lost, but that consequences highly injurious occasionally result from their injudicious use.

Impressed with the importance of arresting the abuse of the White Sulphur waters, and of leading to a more correct administration of them, I published, in 1839, a pamphlet de-

signed as a "Directory" for the use of these waters. It was with diffidence I undertook this pioneer effort in a field so entirely unexplored; for, although thousands of invalids had, for more than half a century, annually resorted to these waters, up to the period of issuing the "Directory," not a line had ever been published, relative to their medicinal applicability, or the proper methods of prescribing them.

Satisfied from experience, that the little *effort* alluded to, was not without beneficial effects in guiding to a more prudent use of the waters, I published, in 1846, a small volume entitled "Virginia Springs," and designed to embrace what was then known of the various mineral springs in Virginia. In 1855, a new and enlarged edition of this work was issued, which being now nearly exhausted, the author, in fulfillment of his promise to the public, has the pleasure to present this volume on the "Virginia Springs and the Springs of the South and West."

In composing the present volume, he has retained essentially the plan of the former one, with much of the matter contained in it; has added new observations and experience in reference to the old fountains, treated of such new ones as have come into notice since his second edition issued from the press, and has enlarged the scope of the treatise by an account, which he hopes will be found useful, of the Springs of our *Southern and Western States.*

In treating of springs as medicinal agents, (and it is in that point of view only, that I have proposed to treat of them,) it has been my earnest effort to present them before the public in an aspect as full and impartial as was possible. So far as

the author's personal knowledge and experience, or reliable information obtained from other sources, have enabled him to do so, he has discharged the task with fidelity.

It is to be regretted that no analysis has yet been made of several of our mineral fountains, whose rising importance deserve such chemical test. Nor have these fountains, as yet, furnished, from observation, such reliable record of their adaptations as is desirable in forming a proper appreciation of their merits; hence, in reference to the precise quality and adaptations of such springs, we are necessarily left to inferences based upon analogies and somewhat uncertain comparisons.

The absence of an analysis of a mineral water is less to be regretted, if a fair and reliable record of its virtues and appropriate medical uses be obtained, for it is only by multiplied facts, that is, by *experience of its use*, that we can speak positively of its effects. This being so, it is of especial importance that there should be an intelligent Resident Physician at each fountain, who would make it his duty carefully to note the character of the various diseases submitted to its use, and the effects of the water upon each case. Under such a system, each fountain would soon establish a reliable *record* for itself; the invalid would be greatly assisted in his selection of the proper agent to which he should resort, and the just character of each water be properly understood, and placed upon a firm and stable foundation. This field of observation offers large and exciting motives to a proper medical ambition; for such, as a general thing, has hitherto been the wild and hap-hazard empiricism in the use of mineral

waters in America, and such is the importance of so classifying and systemizing their uses that they may be prescribed understandingly and safely, that he, who may contribute to this end, and thus render them the safe, certain, and effective remedies they were designed to be by a beneficent Providence, may well feel that he has neither lived nor labored in vain in his generation.

I will only add, that I have endeavored, in getting up this work, to adhere to the plain, unassuming, practical method, which was, I think, a characteristic distinction of my previous volumes, and perhaps their chief merit.

It has been my earnest desire to place in the hands of the public, and especially of invalids, a short and easy, but a condensed and comprehensive, account of the mineral springs of Virginia, and of the Western and Southern States, and to indicate with candor, and with as much plainness as possible, their nature and medicinal applicability.

Wherever I could, with advantage to the public, I have availed myself of the observations of others, and I claim at the hands of my readers, this award of merit, at least: *of having honestly endeavored to make my humble labors convenient and practicably valuable to them;* not by dazzling, but uncertain, theories, nor by creating hopes that might end in sad disappointment, but by plain, practical facts in relation to the nature and proper uses of our various mineral waters.

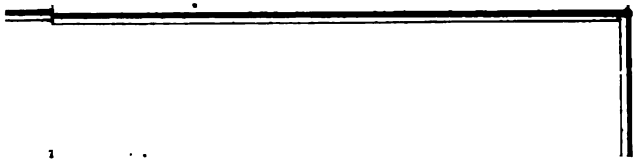
I have intentionally avoided in this, as in my previous volumes, all criticism upon the improvement of spring property, or the character of the accommodations at the several

springs. Such criticism, in a printed volume intended for reference long after its issue from the press, would be likely to mislead, and probably do great injustice; inasmuch as improvements, now faulty, may, before the next season, be rendered very comfortable; and bad hotel accommodations are often amended in a day by a change of landlord or manager. It is of the *nature and medicinal applicability* of mineral waters that I have felt called upon to write; and this I have done without prejudice, fear or favor; having no interest, directly or indirectly, in any of the springs, and influenced alone in my estimation of them by personal observation, or, when this has been wanting, from the most reliable information I could obtain.

I am not vain enough to suppose that none of my opinions are erroneous; to err is both human and common; but upon the honest integrity with which they have been formed, the invalid, the profession, and the general public may rely.

J. J. MOORMAN.

White Sulphur Springs,
Virginia, April, 1859.



VARIOUS ROUTES

TO

THE VIRGINIA SPRINGS.

TAKING WASHINGTON as a *starting-point*, the Virginia Springs may be reached by way of STAUNTON, or LYNCHBURG, by a variety of routes.

The one most expeditious, and most traveled to our Western springs, is by railroad, from *Washington* by Alexandria, Gordonsville, Charlottesville and *Staunton*, to Jackson's River Depot, the present terminus of the Central Railroad, thirty miles distant from the White Sulphur, and about the same from the Sweet and Red Sweet Springs. From this depot, passengers are conveyed in coaches, over excellent roads, to the White Sulphur and other neighboring springs. Those wishing to stop at the Rockbridge Alum, or to go to the Bath Alum, Warm, Hot, or Healing Springs, should leave the cars at Millborough Depot, thirty-eight miles west of Staunton, and five miles from the Rockbridge Alum; whence

they will be conveyed in coaches to their several places of destination.

Another *route* from WASHINGTON, is to proceed by steamboat to Aquia Creek, and thence by railroad to Richmond.

Still another route from WASHINGTON, or *Baltimore*, is to go by way of the Baltimore and Ohio Railroad to Harper's Ferry, thence to Winchester by rail, and from thence, in stage-coaches, on a fine McAdamized road, to *Staunton*, a distance of ninety miles. At STAUNTON, passengers on this route intersect the *Central Railroad*, on which they may proceed farther West; or they may go in stage-coaches up the Valley, by way of Lexington, to the Rockbridge Alum, Natural Bridge, Fincastle, to Daggar's Springs, or to the White Sulphur.

By this *Valley route*, the traveler has the advantage, with a little extra jolting in stages, and one or two days delay, of seeing *Harper's Ferry*, and the romantic meeting of the waters of the Potomac and Shenandoah; to see which, Mr. Jefferson said, was "worth a voyage across the Atlantic;" of traveling almost the entire length of the Shenandoah Valley, in an agricultural point of view, the most fertile and interesting portion of Virginia. He passes within seven miles of the famous *Weyer's Cave*, and may conveniently visit it from *Mount Sidney*, losing one day in his travel; and last, though

not least, he may pass over the celebrated *Natural Bridge*, with an allowance of time, if he be in a public conveyance, to take a glimpse of its magnificent structure.

Persons wishing to visit Jordon's White Sulphur, Shannondale or Capon Springs, should travel this route, leaving the cars for the former at *Stevenson's Depot;* for Shannondale, at *Charlestown;* and for Capon, at *Winchester.*

From *Baltimore*, persons who prefer that mode of travel, may proceed by *steamboat* down the Chesapeake Bay to *Old Point*, one hundred and seventy-nine miles distant, and thence up the James or York Rivers, one hundred and eighteen miles, to Richmond.

At *Richmond*, you have choice of three routes; either to take the *Central* Railroad, by way of Gordonsville, Charlottesville and *Staunton*, to the Jackson River Depot, the most direct and most traveled route; or you may take the Danville and South-side Railroad to *Lynchburg;* or you may go by canal-boat up the James River Canal to Lynchburg, and from thence, by railroad and stages, into the spring region.

At LYNCHBURG, the traveler going directly to *Daggar's Springs*, or the *White Sulphur*, may leave the cars at *Buford's Depot*, thirty-five miles from Lynchburg, and proceed by stages twenty-eight miles to Daggar's, and thence forty-three to the "White," or he may leave the

cars at Bonsack's, and proceed by coach to the White Sulphur, by way of the Sweet and Red Sweet Springs.

Travelers from the *East* or *North*, destined directly for any of the springs in the *southwestern* part of the State, should make Lynchburg a point, whence they may proceed on the Virginia and Tennessee Railroad to Coiner's Black and White Sulphur, Alleghany Springs, Montgomery White Sulphur, and the Yellow Springs, all of which are reached from Lynchburg in the order in which they are here enumerated.

The *Southwestern* traveler has now very great facility in getting into the spring region of Virginia. All such, starting from any point west of *Atlanta*, Georgia, and south of the Ohio River, may properly make *Knoxville*, Tennessee, a point from whence they may proceed directly by way of the Tennessee and Virginia, and Virginia and Tennessee Railroads, into our spring region.

Those wishing to proceed to the Red or Salt Sulphur directly, may leave the cars at Newbern, and proceed by coaches thirty-five miles to the Red, or to the Salt, seventeen miles farther.

Travelers destined for the *Salt Sulphur* directly, may reach these in forty miles from Christiansburg by stage.

Those going direct to the Greenbrier *White Sulphur*, the *Roanoke Red*, the *Sweet*, or *Red Sweet Springs*, may leave the cars at *Salem*, reaching the former in

sixty-two, the latter in about forty-five, and the Roanoke Red in ten miles from Salem.

Those destined for the *Yellow Springs*, *Montgomery White*, *Alleghany*, or *Coiner's* Springs, will reach them, or depots near them, by the railroad, in the order in which these springs are here enumerated.

The *Western* traveler to the Virginia Springs, unless he make a circuitous route by way of the Baltimore and Ohio Railroad to Washington, and thence to STAUNTON, has but little choice of routes. The usual way of reaching the springs from this quarter, is to debark from steamboats at *Guyandotte*, and travel by stage-coaches into the spring region. The Blue Sulphur is reached in one hundred and thirty-eight miles from Guyandotte, and the White Sulphur in one hundred and sixty. Travelers sometimes take the *Kanawha boats* at Louisville, or Cincinnati, and proceed up the Kanawha River to Charlestown, where they take stage; this shortens the stage travel about fifty miles.

SYNOPSIS OF ROUTES

OF TRAVEL FROM THE NORTH, EAST, SOUTH AND WEST, TO THE MINERAL SPRINGS OF VIRGINIA.

TRAVELERS from the North, East, or South, should remember, that to reach any of the Mineral Springs in Western or Southwestern Virginia, by the public conveyances, they must *necessarily* make either STAUNTON, or LYNCHBURG, *points* in their journey. These two places then, may be regarded as the great converging and diverging points in this travel. For visitors to the Alum, White Sulphur and other Springs in that quarter, *Staunton* is the preferable point; for the springs in the Southwest, Coiner's, Alleghany, and others in their region, *Lynchburg* should be preferred.

Places in italics, and marked with an asterisk (*), are points of *dêtour* to neighboring springs.

TRAVEL FROM NORTH, EAST AND SOUTH.

Where from.	Conveyances.	To what place.	Miles.
WASHINGTON	Steamboat	Alexandria	7
Alexandria	Railroad	Junction	27
Junction	Railroad	Gordonsville	63
Gordonsville	Railroad	Charlottesville	22
Charlottesville	Railroad	STAUNTON	40
**Junction*	Railroad	*Fauquier Springs*	28
WASHINGTON	Steamboat	Aquia Creek	50
Aquia Creek	Railroad	Fredericksburg	18
Fredericksburg	Railroad	Central R. R. Junction	42
Central R. R. Junction	Railroad	Richmond	25
Richmond	Railroad	Gordonsville	90
Gordonsville	Railroad	Charlottesville	22
Charlottesville	Railroad	STAUNTON	40
**Fredericksburg*	Stage	*Fauquier Springs*	40
WASHINGTON	Railroad	Harper's Ferry	112
Harper's Ferry	Railroad	Charlestown	12
Charlestown	Railroad	Winchester	20
Winchester	Stages	Woodstock	28
Woodstock	Stages	Harrisonburg	38
Harrisonburg	Stages	STAUNTON	25
**Harper's Ferry*	Railroad	Martinsburg	19
Martinsburg	Railroad	St. John's Depot	28
**St. John's Depot*	Stage	*Berkeley Springs*	2½
**Charlestown*	Stage	*Shannondale Springs*	5
**Winchester*	R. R. & Stage	*Jordon's White Sulphur*	7½
**Winchester*	Stages	*Capon Springs*	23
**Harrisonburg*	Coach	*Rawley's Springs*	12
BALTIMORE	Steamboat	*Old Point*	179
Old Point	Steamboat	Port Walthall	100
Port Walthall	Railroad	Richmond	18

Where from.	Conveyances.	To what place.	Miles.
RICHMOND	Central R. R.	STAUNTON	140
Richmond	S. Side R. R.	LYNCHBURG	126
Richmond	Canal Boat	LYNCHBURG	146
**Richmond*	Railroad	Robiou's	10
Robiou's	Stage	*Huguenot Springs*	6
STAUNTON	Railroad	Millborough Depot	38
Millborough Depot	Railroad	Jackson River Depot	20
Jackson River Depot	Stages	*White Sulphur Springs*	30
*Millborough Depot	Stages	*Rockbridge Alum Springs*	5
*Millborough Depot	Stages	*Bath Alum*	10½
Bath Alum Springs	Stages	Warm Springs	5½
Warm Springs	Stages	Hot Springs	5
Hot Springs	Stages	*White Sulphur*	37
**Hot Springs*	Stages	*Healing Springs*	3½
*Staunton	Stages	Stribling's Springs	12
STAUNTON	Stages	Lexington	36
Lexington	Stages	Natural Bridge	14
Natural Bridge	Stages	Buchanan	12
Buchanan	Stages	Daggar's Springs	16
Daggar's Springs	Stage	*White Sulphur*	43
**Lexington*	Stages	*Rock Alum Springs*	17
**Lexington*	Stages	*Rockbridge Baths*	14
LYNCHBURG	Railroad	Bonsack's	47
**Bonsack's*	Stages	*Sweet and White Sulphur*	47 / 64
**Bonsack's*		*Coiner's Springs*	1
Bonsack's	Railroad	Shansville	30
**Shansville*	Stages	*Alleghany Springs*	3½
*Shansville	Railroad	*Montgomery W. Sulphur*	6
Shansville	Railroad	Christiansburg	9
**Christiansburg*	Stage	*Yellow Springs*	4

Where from.	Conveyances.	To what place.	Miles
Christiansburg	Railroad	Newbern	19
*Newbern	Stage	*Pulaski Alum Springs*	10
Newbern	Railroad	Wytheville	28
*Wytheville	Stage	*Grayson's White Sulphur*	20
*Lynchburg	R. R. & Stage	*N. London Alum Springs*	11
LYNCHBURG	C'l Boat, etc	Natural Bridge	36
Natural Bridge	Stages	Daggar's Springs	28
Daggar's Springs	Stage	*White Sulphur*	48

TRAVEL FROM SOUTHWEST.

KNOXVILLE, Tennessee	Railroad	Jonesborough, Tenn	100
Jonesborough	Railroad	Bristol	86
Bristol	Railroad	Abingdon	15
Abingdon, Virginia	Railroad	Marion	29
Marion	Railroad	Wytheville	27
Wytheville	Railroad	Newbern	28
*Wytheville	Railroad	Grayson's Sulphur	20
Newbern	Railroad	Christiansburg	19
*Newbern	Stage	*Red Sulphur*	35
*Newbern	Stage	*Salt Sulphur*	52
*Newbern	Stage	White Sulphur	77
*Christiansburg	Stage	*Montgomery W. Sulphur*	5
*Christiansburg	Stage	*Salt Sulphur*	40
*Christiansburg	Stage	*White Sulphur*	65
Christiansburg	Railroad	Salem	26
Salem	Railroad	Bonsack's	13
*Salem	Stages	Roanoke Red Sulphur	10
Bonsack's	Railroad	Lynchburg	47
*Bonsack's	Stages	*White Sulphur, etc. etc.*	64

TRAVEL FROM THE WEST.

Where from.	Conveyances.	To what place.	Miles.
CINCINNATI	Steamboats	Guyandotte	150
Guyandotte	Stages	Charleston	48
Charleston	Stages	Blue Sulphur	90
Blue Sulphur	Stages	Lewisburg	13
Lewisburg	Stages	White Sulphur	9

TRAVEL BETWEEN THE DIFFERENT SPRINGS.

White Sulphur	Stages	Blue Sulphur	22
White Sulphur	Stages	Salt Sulphur	25
White Sulphur	Stages	Red Sulphur	40
White Sulphur	Stages	Red Sweet	16
White Sulphur	Stages	Sweet Springs	17
White Sulphur	Stages	Hot Springs	37
White Sulphur	Stages	Healing Springs	40
White Sulphur	Stages	Warm Springs	42
White Sulphur	Stages	Bath Alum	47
White Sulphur	Stages	Rockbridge Alum	62
Blue Sulphur		Salt Sulphur	25
Blue Sulphur		Red Sulphur	32
Salt Sulphur	Stages	Red Sulphur	17
Salt Sulphur	Stages	Sweet and Red Sweet	23
White Sulphur	Stages	Coiner's Springs	64
White Sulphur	Stages & R. R.	Alleghany Springs	97
White Sulphur	Stages & R. R.	Montgomery W. Sulphur	100
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SPRINGS OF THE SOUTH AND WEST.

CHAPTER I.

VIRGINIA SPRING REGION—ERRORS IN SPRING NOMENCLATURE, ETC. ETC.

WITHIN the last few years, important changes have taken place in the mineral spring interest of Virginia. These changes consist partly in the vastly extended accommodations at some of the old fountains, but still more in the discovery and improvement of many new ones.

Although every great division of the State furnishes mineral fountains of value, that portion of it distinctly noted as the *Spring Region*, has, heretofore, been regarded as being confined to narrow limits on both sides of the Alleghany Mountains; having the *Rockbridge Alum* for its eastern, and the *Red Sulphur* for its southwestern boundary, while the *White* and *Sweet* occupied the centre.

The increased visitation to the mineral waters of our mountains, within the last few years, occasioned, doubtless, in a great degree by the increased and extended confidence in their efficacy—and stimulated to some extent by the general prosperity of the country, enabling greater numbers to travel—has largely developed, among the people of our mountain regions, a desire for the discovery and improvement of spring property. To this end, the increased facilities of travel, by railroad, through the Southern country generally, and especially into our mountains, in connection with the increased energy and enterprise of the age, have doubtless much contributed. Under these combined influences, the public effort has been peculiarly prolific in discovering and improving, for public accommodation, numerous interesting fountains; partly in the Old Spring area, but especially in the regions south and southwest of it, and on both sides of the Alleghany, in the counties of Botetourt, Montgomery, and Pulaski. These newly discovered springs are of various qualities of *Sulphur*, *Chalybeate*, and *Aluminous Sulphated Chalybeate* waters; with one of a new and interesting character, at least with us, being more strictly *Saline* than any fountain heretofore known in the State.

It will be perceived, that the discovery and improvement of these springs essentially enlarges the circle of our spring region, and makes it to embrace

the entire *eastern* and *western* bases of the Alleghany, from the Alum Springs in the east, to the Blue Ridge in the southwest.

Increased settlement and improvement of the country, lying north along the line of our great Apalachian chain, will, in all probability, ultimately develop valuable mineral springs along the course of its great upheavings; thus making the Virginia Spring Region appropriately to embrace the entire length of the Alleghany, from the Potomac to its extreme southern terminus. The correctness of this surmise is rendered more than problematical, from the general geological character of this entire range, and from the fact of the existence of the valuable mineral waters of *Capon* and *Berkley*, at the northern, and the recently discovered waters at the southern extremity of the line.

Such is now the importance of the spring interest of Virginia, that it should no longer be reckoned in regard to the interest of spring proprietors merely, or of the individuals that resort to it for health and pleasure, but as an actual and substantial element of political economy, pertaining to the interest of the whole Commonwealth. It is an interest of no inconsiderable aggregate results to the whole State, but one that has heretofore been too much overlooked in the legislation of the country. It is a matter of gratulation, no less to the political economist, who desires to see the prosperity of the Com-

monwealth, than to the philanthropist and man of science, who takes pleasure in the development of remedies for the ills of humanity, that this important interest is now becoming to be properly appreciated by the country at large, and will henceforth, it is to be hoped, receive that fostering care from our legislature which is so essential to its ultimate limit of prosperity.

ERRORS IN SPRING NOMENCLATURE, ETC.

In America, more than in any other country, we have adopted a *nomenclature* for our mineral waters, which, while it seems to have been intended to convey an *idea of their quality*, is, nevertheless, from being vaguely and unscientifically applied, well calculated to mislead, and to fix misapprehensions on the mind as to their true nature and precise medical character. I allude to the prevalent custom of calling our mineral fountains after some one, generally the most obvious material that prevails in them, as judged by the taste, smell, or sight. Hence, we are in the habit of calling a portion of our springs *Alum*, because the water has a predominant taste of that mineral; although analysis proves, and still more experience, that Alum, considered singly, cannot constitute the efficiency of such waters. Even what proportion in value it bears in making up the excellent compound of some of them, such as the Rock-

bridge Alum for instance, is very uncertain. Sure it is, that the therapeutic character of that water forbids the idea, that the article which gives it its name can be, singly considered, the agent of its valuable remedial influences. Indeed, the name of this water, perhaps more than any other in the country, is calculated to mislead the uninitiated as to its chief characteristics. With every one, the idea of astringency is associated with the use of alum! and various persons, as I learn, to whom that water might have been useful, have been deterred from visiting it, judging, from its name, that it would exert a hurtful influence upon them.

The Rockbridge Alum, to say nothing of other valuable qualities, will, in a majority of cases, purge gently. Alum, all know, exerts a contrary effect upon the bowels. It is the *compound* then, in this, as it is in most mineral waters, that gives to it its peculiar and valuable powers. We ought not to lose sight of this fact, in estimating the applicabilities of this water.

Again, we know that there are some waters bearing the name of Alum, and to the taste almost identical with our best standard Alum waters, that, upon chemical examination, are found to contain scarcely an appreciable quantity of that mineral; the styptic, or alum taste, being occasioned by the iron and sulphuric acid they hold in solution.

So, under a sweeping generic nomenclature, all

our waters are called *Sulphur*, in which sulphuretted hydrogen gas can be discovered; although sulphur perhaps, singly considered, is among the least efficient of their ingredients. Hence, as with the Alum waters, it is their various salts, so *compounded* by the plastic hand of nature, as the chemist or apothecary never can attain to, that gives them their peculiar efficacy.

In reference to these particular waters, a sort of *branch nomenclature* has become as common as such fountains themselves, and is still more unmeaning than their generic designation, so far as it fails to convey indications of medicinal quality.

I allude of course to the designations of *White*, *Red*, *Blue*, *Gray*, *Black*, etc., of our several sulphur springs. These various names are well enough merely to designate a place; but, of themselves, they convey no idea at all of quality, or appropriate medical applicability.

The natural deposits of all sulphur waters, uninfluenced by foreign bodies, are essentially of the same color, being white, or opaque-white; the various shades of red, blue, gray, black, etc., are occasioned from the influence of light or shade; or, by chemical changes produced by contact with foreign bodies.

CHAPTER II.

MINERAL WATERS IN GENERAL.

Definition of Mineral Waters; Estimation in which they were held by the Ancient Greeks and Romans—Pains taken to analyze Mineral Waters in France—Advantages to be derived from Analysis of Mineral Waters—Mineral Waters abound in the United States—Want of Information both among Physicians and the Public in relation to Mineral Waters; Mistakes and Injuries that result from want of Information—The *direct* and active Influence of Mineral Waters—*Modus Operandi* of Mineral Waters; Must not always look to the immediate Effects of Mineral Waters for the production of the good they accomplish; the Alterative action of Mineral Waters generally their most efficient action—Mineral Waters not adapted to Acute Diseases; they are adapted to Chronic Diseases; should be perseveringly used, regarding their *Effects*, not the time that they may have been used—Mineral Waters are Stimulants; Difference *with* or *without* their Gases—Similarity between Mercury and Sulphur Waters—Errors often committed in the Use of Mineral Waters—The action of Mineral Waters may be modified or changed by different methods of using them—Changing from Spring to Spring—Dress—Diet and Exercise.

Early use of, etc. etc.—Mineral waters rank among the ancient remedies used for the cure of disease. The Greeks, who in knowledge of medicine were superior to the nations who had preceded them, re-

garded natural medicated waters as a special boon of the Deity, and piously dedicated them to Hercules, the god of strength. They used them for drinking, and for general and topical bathing. Hippocrates was acquainted with the value and uses of various mineral waters, and many other Greek physicians, we are told, employed them for numerous diseases for which they are used at this day.

With the Romans, mineral waters were a familiar remedy, not only in Italy, but in all the countries over which that nation obtained dominion. Mineral springs were eagerly sought out in the countries over which their conquests from time to time extended, and prompted by "gratitude for the benefit which they experienced from their use, they decorated them with edifices, and each fount was placed under the protection of a tutelary deity." (*Bell.*) Pliny, in his natural history, treats of various mineral waters and their uses; and it is a fact worthy of remark, that they were highly recommended by various Roman physicians, in the fifth century, in the same diseases for which they are at this day so much employed—particularly for nervous and rheumatic diseases, and for derangements of the liver, stomach, and skin.

With the modern nations of civilized Europe, mineral waters, both as internal and external remedies, have always been held in high estimation. The national regulations that have from time to time

been adopted to investigate their virtues and their appropriate applicability, and to guard against their improper use, sufficiently manifest the importance that has been attached to them as remedial agents. Henry IV., we are told, "during his youth had frequented the springs of the Pyrenees, and witnessing the abuses in the employment of so useful a remedy, sought to correct them after his ascension to the throne of France. He nominated by edicts and letters-patent, in 1603, superintendents and superintendents-general, who were charged with the entire control over the use of mineral waters, baths, and fountains of the kingdom. Most of the mineral springs and bathing establishments on the continent of Europe are placed under a somewhat similar superintendence, and a resident physician is also appointed by the government." (*Bell.*)

Although mineral waters had been favorite remedial agents with the enlightened nations of the earth for many centuries, it was comparatively but recently that chemistry, by minute analysis, was able to determine with precision their constituent parts.

In 1670, the mineral waters of France were first fully analyzed by a commission appointed by the Academy of Sciences at Paris; but it was not until 1766, nearly a hundred years afterwards, that Bayen discovered the means of separating sulphur from sulphurous waters—nor until 1774 that the celebrated Borgamann demonstrated the existence of

sulphuretted hydrogen gas. Meanwhile, physicians stationed at the several watering places were active in observing and noting the various operations of the different waters on the human system, and in determining, from experience, the various cases in which they were beneficial or injurious.

Experience the only sure Guide in the Administration, etc.—After all that science can effect in determining the component parts of mineral waters, it is *experience* alone in their use, that can be fully relied upon as to their specific effects, or applicability to particular diseases. Chemical analysis is important mainly as a matter of general scientific knowledge, and may be so far practically useful to the physician as to enable him to form correct *general views* as relates to the nature and powers of the remedy; but it is fallacious to suppose that an analysis, however perfect, can ever enable the physician, in the present state of our knowledge, and in the *absence of practical observation*, to prescribe a mineral water with confidence or safety. An accurate knowledge of the component parts of mineral waters might do much, I admit, to prevent the incessant mistakes and mischief which medical men commit in sending their patients, "*hap-hazard*," to drink mineral waters which are often unadapted to their cases; but it never can, in the absence of experimental knowledge, qualify them for giving specific and detailed directions for their use. Dr. John Bell, in his valuable work on "Baths and

Mineral Waters," has the following sensible and judicious passage upon this subject: "I wish not," he says, "to be ranked among the chemical physicians, who, having discovered the proportion of each foreign ingredient in the mineral spring, and studied its operation on the economy, pretend to determine the general effect of the compound. We may, indeed, by a knowledge of the constituent parts, predict to a certain extent the medicinal power of the compound; but it is only by multiplied facts, that is, *experience of its use*, that we can speak positively of its virtues."

In no other country, perhaps, do mineral waters abound in greater variety than in the United States, and it is a subject of sincere regret, that their nature, applicability, and proper method of administration should have been so little studied, both by physicians and the public at large. It is true that certain opinions generally prevail in enlightened circles as regards the curative powers of some of our more celebrated fountains; and these opinions, so far as they go, being generally founded on experience, may, in the main, be tolerably correct. Nevertheless, there is a lamentable want of information generally, and even among our more enlightened physicians, as to the *specific nature and adaptation of our mineral waters to particular diseases*—information, the want of which must always disqualify for the safe and confident recommendation of these valuable agents.

A perfect knowledge of the various influences, and of the peculiar minute circumstances that control the use of mineral waters in different systems, as well as the best methods of using them in certain pathological conditions of the system, must, as with all other medicines, be learned from observation. Now, as physicians but rarely have an opportunity of observing the use of mineral waters for a sufficient length of time and in a sufficient variety of cases, and as but little has been written by those who have observed their effects, it ought not to be supposed that the medical public generally would be greatly enlightened on this subject.

I have said that the opinions generally prevailing in enlightened circles relative to the curative powers of our principal mineral fountains, being founded on experience, may, in the main, be correct. I would not be understood, however, as advising a reliance upon such "popular fame." Information of this kind is sufficient to awaken attention and incite inquiry, but certainly should not be implicitly relied upon in individual cases. At best, it is generally "hearsay" opinion, made up, ordinarily, from partial and empirical sources; or, quite as likely, from the prejudiced accounts which are brought by visitors from the different watering places, and which are *sweepingly* favorable, or prejudicial, as they may chance to have been benefited or worsted, and that without reference to the specific action of the agent, or that clear understand-

ing of the pathology of the case, which would serve as a safe guide in its application to others. Every physician knows how prone persons are to err in the use of medicines, from the supposed resemblance of cases. Often am I pained to see persons persevering in the use of a mineral water to their evident prejudice, and for no better reason than that Mr. or Mrs. Such-a-one was cured of a disease supposed to be similar; or, by the general recommendation of some medical man who sent them to the "mountains" with a "*carte blanche*," to use "*some of the mineral waters*." Occasionally it has become my painful duty to advise patients to retrace their melancholy steps homeward, without using any of the waters, because none were adapted to their case.

Mineral waters are not a *panacea;* they act, like all other medicines, by producing certain *effects* upon the animal economy, and upon principles capable of being clearly defined. It follows, that there are various diseases and states of the system to which they are not only not adapted, but in which they would be eminently injurious.

Some years since, I was requested to visit a highly respectable gentleman, who had just arrived at the White Sulphur with his family, from one of our distant cities. He was in wretched health, and sought my advice as to the applicability of the water to his case. On examination, I felt astonished that any medical man of intelligence should have recom-

mended such a case to mineral waters for relief. I advised the gentleman to retrace his steps homeward, and put himself under medical treatment, as he had no time to lose. Accordingly, the ensuing morning he recommenced his journey of seven hundred miles to reach his home. Medicine did for him what mineral waters were not calculated to do, and I have since heard of his entire recovery. This gentleman informed me that he had been influenced to undertake the distant, and, to him, painful journey, by a physician who had never before prescribed for his case, and who candidly stated to him that he knew but little of the mineral waters of Virginia; but he had heard of many cures from their use, and therefore advised that he should hasten to give them a trial. Influenced by this vague opinion, the unfortunate invalid had dragged himself and his family seven hundred miles, under the vain hope of finding a remedy, which the physician should, in such a case, have found in his own office. Now a little more knowledge of the nature of our mineral waters, and a more commendable caution in advising their use, would have prevented the heavy sacrifice this gentleman incurred. Nor is this by any means an isolated instance; my case-book furnishes many others equally strong, that have come under my observation within the last few years.

Medical Efficacy, etc.—Mineral waters are exceedingly valuable as medicinal agents, are applicable to

a large circle of cases, and will, unquestionably, cure many which the ordinary remedies of the shops will not. Nevertheless, it should always be borne in mind that they are not a *catholicon;* that they are not to be used for every disease; and that, to be prescribed successfully, they must, like all other medicines, be prescribed with reference to the nature and pathology of the case. Nor is this caution ordinarily more necessary in using the various medicines of the shops than in using the more potent mineral waters.

Some there are, I know, who profess to be unbelievers in the medicinal activity of mineral waters, and who, without denying the benefit that is often derived from visiting such fountains, attribute the whole to travel, change of air, exercise, relaxation from business, etc. etc. Now, I freely admit that these are often important agents in the cure of a large class of cases; but, from long experience at a popular watering place, and the numerous cures I have seen effected from the water itself, totally disconnected with any of the adjuncts alluded to, it would be quite as easy to convince me that *bark* is not tonic, that *jalap* does not purge, or that *mercury* will not salivate, as that mineral waters may not be an active and potent means of curing disease, entirely independent of the valuable adjuvants that have been alluded to.

The advocates of the non-efficacy of mineral waters

per se, would scarcely persist in this opinion, after seeing the large amount of active medical material obtained by evaporation from some of our more active waters; the *white sulphur*, for instance, which yields more than one hundred and fifty grains to the gallon, and which, upon analysis, is found to consist of *iodine*, *sulphur*, the various combinations of *soda*, *magnesia*, and other active ingredients. Would it not be absurd to believe that so large an amount of these efficient medical substances, as is usually taken into the stomach by those who drink mineral waters in which they abound, could fail to exert a *positive influence* upon the economy? My own experience for many years, in the use of such waters, enables me to bear the most unequivocal testimony as to the *direct* and positive influence of many of them upon the human body. In the language of the celebrated Patissier I can unhesitatingly say, that, "in the general, mineral waters revive the languishing circulation, give a new direction to the vital energies, re-establish the perspiratory action of the skin, bring back to their physiological type the vitiated or suppressed secretions, provoke salutary evacuations either by urine, or stool, or by transpiration; they bring about in the animal economy an intimate transmutation—a *profound change;* they saturate the sick body. How many sick persons, abandoned by their physicians, have found health at mineral springs? How many individuals, exhausted by violent disease,

have recovered, by a journey to mineral waters, their tone, mobility, and energy, to restore which attempts in other ways might have been made with less certitude of success." And hence, most cordially do I adopt the sentiments of the distinguished Dr. Armstrong, who, in speaking of the medicinal efficacy of mineral waters, says, "*I dare pledge my word, that, if they be only fully and fairly tried, they will be found among the most powerful agents which have ever been brought to the relief of human maladies.*"

Modus Operandi, etc.—Various attempts have been made to account for the peculiar effects of mineral waters upon the system. They seem to act, in the first place, as a simple hygienic agent. Secondly, they act, in accordance with their constituent ingredients, specifically on the animal economy. Mineral waters exert their more important influences upon the human body upon a different principle from many of the articles of the meteria medica; they are evidently absorbed, enter into the circulation, and change the consistence as well as the composition of the fluids; they course through the system, and apply the medical materials which they hold in solution, in the most minute form of subdivision that can be conceived of, to the diseased surfaces and tissues; they reach and search the most minute ramifications of the capillaries, and remove the morbid condition of those vessels, which are so commonly the primary seats

of disease. It is thus that they relieve chronic disordered action, and impart natural energy and elasticity to vessels that have been distended either by inflammation or congestion; while they communicate an energy to the muscular fibre and to the animal tissues generally which is not witnessed from the administration of ordinary remedies.

Many of the articles of the materia medica seem to act by sympathy and counter-irritation, and to cure one organ of the body by irritating another; thus calomel, by irritating the stomach and duodenum, is made to act efficiently upon the liver, to which organ it has a strong specific tendency. Not so, however, with mineral waters; *they never cure one organ by irritating another.* I can with confidence assert, that I have never seen mineral waters successfully used in any case in which they kept up a considerable irritation upon any of the organs of the body.

Both physicians and patients are quite too much in the habit of looking to the *immediate* and *sensible operations* of mineral waters, and of judging of their efficacy from such effects. In most cases, it is serviceable for such agents to open the bowels gently; and in some, it is best for them to purge actively. Occasionally, advantage is derived from promoting an increased flow of urine or perspiration; but, as a general rule, the greatest good is derived from the *absorption* of the water, resulting in that "profound

change" spoken of by Patissier, or, in other words, the *alterative* action of the remedy. It should always be borne in mind that this *profound change*—this *alterative effect*—is incompatible with constant or active action of the water upon any of the emunctories. This, unquestionably, is true as relates to the *White Sulphur Water*, and I believe it to be so with all alterative waters.

So well convinced am I, that the *alterative action* is the real curative action effected by *sulphur waters*, in nine cases out of ten where any serious disease exists, that, ordinarily, I am not solicitous to obtain much daily increase of evacuation from any of the emunctories. On the contrary, I often find great advantage from the administration of some appropriate means to *prevent* the too free action of the water, especially on the bowels and kidneys. As a general rule, it is far better that such waters should *lie quietly upon the system*, without manifesting much excitement upon any of the organs, and producing, at most, but a small increase in the quantity of the ordinary healthy evacuations.

The *quality* or kind of evacuations produced by mineral waters is a matter of far more importance, and, when strong sulphur waters are used, never fail to evidence the existence and the extent to which alterative action is going on in the system, and to this persons using such waters should always pay a careful attention.

I have said that the best effects of mineral waters are their *alterative* or *changing* effects; and that in the administration of the White Sulphur, I do not, ordinarily, desire to provoke much increase of the natural evacuations. I do not wish, however, to be understood, by this general declaration, as laying down an absolute rule of practice to govern all cases. The administration of this water, like the administration of every other active remedy, should be governed in reference to the particular character and demands of each case; and in such discriminating practice, it will sometimes be found best to use it in a manner to produce active operations for a short time. I have, indeed, generally found, that those who are actively purged by mineral waters, if they have strength to bear it, will be best satisfied with the remedy *at the time*, and, in fact, are apt to feel better *at the time*, than those upon whom the water is exerting but little or no purgative effect. It may be laid down as a general fact, in the use of the *White Sulphur*, subject to but few exceptions, that those on whose bowels it acts freely, will feel best *while at the Springs;* while those who are but little purged, will feel best after they have *left the Springs*, and will, ordinarily, enjoy the most permanent advantage. The reason of this is obvious; in the first case, the active purgation throws off the gross humors of the body, and the patient feels promptly relieved; in the other case, the remedy lies upon the system,

is absorbed, and gradually produces its changing influences—bringing the various secretory functions into a healthy condition—unloading and cleansing the machinery of the economy—silently putting its *works* to rights, and giving them their natural and healthy motion. All this requires time for its accomplishment; and hence, we often hear persons say, "I was no better while at the Springs, but I began to mend soon after I left, and have continued better since." Declarations of this kind we hear every day by persons who have previously visited the Springs; and they verify the correctness of my proposition.

Length of Time to be used, etc.—To acute diseases, mineral waters are not adapted; for all such they are too exciting, too prone to increase the activity of the circulation, and to stimulate the general system. It is in *chronic* diseases only that they are found so eminently serviceable. By chronic diseases I mean those slow diseases of the system uniformly attended either with *simple excitement*, chronic *inflammation*, or chronic *congestion* of the blood-vessels. To be permanently beneficial in diseases of this description, the use of mineral waters, like the disease for which they are taken, should be "chronic." I mean an instantaneous cure should not be expected; but that the remedy should be persisted in, and the cure gradually brought about. Sulphur waters may

be easily brought into disrepute by short and imperfect trials of them. To prove effectual, "they should for the most part be continued daily, in sufficient quantity, until the disease gives way, or until their inefficacy has been fairly proved by an unremitted perseverance. In some cases of *ophthalmia*, of *rheumatism*, and *slight cutaneous affections*, I have known them to effect a cure in two or three weeks, while in other cases, apparently similar in all respects, twice, thrice, or even four times that period has elapsed before the cure had been accomplished; and what is here affirmed of these external affections, is still more strongly applicable to internal diseases, which are seldom speedily overcome by these waters, how completely soever they may yield at last. In illustration of this point, as to internal diseases, it may be mentioned that I have seen both chronic inflammation of the liver, and chronic inflammation of the rectum, where no benefit was produced for three or four weeks, and yet a *continuation* of the waters for six or eight weeks longer has effaced every vestige of the morbid indications for which they were prescribed." (*Armstrong on Sulphur Waters.*)

There is no greater folly in the use of mineral waters, than that of laying down a *definite period of time for which they should be used*, without reference to their effects upon the system. Like all other medicines, mineral waters should be used, discontinued, or modified in their use, with a strict re-

gard to their operations upon the body, and to their good or bad effects upon the disease. Whenever prescribed, their operations should be watched with the same care with which we watch the effects of any other medicine; and they should be persevered in, or temporarily or permanently discontinued, or controlled in their action by some appropriate adjuvant, according to the indications presented in each case.

It will occur to every reflecting mind, that the expectation of being cured, or even essentially benefited, in an *obstinate chronic disease*, from a few days' use of any mineral water, is altogether unreasonable. Nevertheless, I have often seen persons at watering places despairing of the efficacy of the remedy, simply because it had not produced an obvious and appreciable benefit in five or six days. A sort of *stereotyped* opinion indeed prevails with numerous visitors to such places, that the water should not in any case be used longer than two weeks. I scarcely need say that this is a most erroneous opinion, and often interposes between the patient and his recovery; instances of which I almost daily see at the White Sulphur. It is true, that some who hold the unwarrantable opinion alluded to perseveringly endeavor to drink as much in the "two weeks" as they should do in six, but this only serves in a common way to make them abandon it four or five days before their prescribed time, by absolutely disqualifying the system for its reception at all.

I can say, as the result of many years' observation, that the *White Sulphur*, which is one of the strongest sulphur waters in the world, rarely produces its full *alterative* effects within two weeks, under its most judicious administration, and under favorable circumstances for its use; and that three, four, five, and even eight weeks often elapse before it has displayed its full remedial powers in obstinate cases.

General Remarks on the Administration, etc. etc. Mineral waters are all *stimulants* in a greater or less degree, and some have attributed much of their virtue to this property. Such an opinion, however, is clearly erroneous. I have already remarked that such waters are rarely serviceable when they keep up any considerable irritation of an organ. I now remark, that any considerable excitement of the general organism is equally prejudicial: indeed I have often been embarrassed, and sometimes thwarted in the successful use of mineral waters, from the prevalence of this quality. The amount of excitement resulting from the use of such waters depends upon the nature of their constituent principles; upon the quantity taken, the manner of taking it, and the excitability of each individual's constitution. If it be a water abounding in sulphuretted hydrogen gas, the most essential difference exists in taking it *with* or *without its gas;* that is, in taking it fresh at the

spring, or after its gas has flown off. In the use of the *White Sulphur Water*, with or without its gas, the most marked difference exists in its stimulating quality. In relation to this particular water, it is greatly advantageous in many cases, particularly in very excitable persons, to have the gas expelled in part, or in whole, before using it.

Some mineral waters, by varying the method of their administration, or by the interposition of appropriate adjuvants, are capable of extensive and valuable modified actions and effects upon the human body. The White Sulphur is susceptible of as many varied, different, and modified actions upon the system generally, and upon its particular organs, by varying the methods of using it, as is *mercury*, or *antimony*, or any of our leading therapeutical agents. For instance, it can be so used as to *stimulate* distressingly; or, without any *appreciable stimulating effect.* It can be so given as almost invariably to *purge actively;* or, without lessening the quantity producing such effect, but merely by changing the time and manner of taking it, it can be so given as to exert little or no cathartic operation. It may be directed to, or restrained from, the *kidneys*, or skin; and what, in a general way, is far more important, it can be so used as to *lie quietly* on the system, producing no excessive action upon any of the organs, and, with a quiet but sure progress, go on breaking up the obstructions in the glandular organs and re-

moving the impediments to the proper discharge of their functions: equalizing the circulation, removing chronic inflammations, and generally restoring the energies of the system.

Resemblance to Mercury, etc.—Between the action of *mercury*, and the more powerful of the sulphur waters, on the organic system, the most striking similarity exists. Dr. Armstrong long since remarked the resemblance between mercury and the sulphur waters of Europe, and confidently expressed the opinion that the latter are equally powerful as the former, in their action upon the secretory organs; and with this very important difference, that while the long-continued use of mercury, in chronic disease, generally breaks up the strength, that of the sulphur waters generally renovates the whole system. Mercury has heretofore, by common consent, been regarded as the most powerful alterative we possess. I am not prepared to dispute this high claim of the medicine, but this much I will assert, as a matter of professional experience, that sulphur water, in my hands, has proved an *alterative* quite as certain in its effects as mercury, though somewhat slower in its operations. Not only so, I believe it to be far better adapted than mercury to a large circle of cases, in which glandular obstructions and chronic inflammations are to be subdued. If the claims of the two remedies for preference were otherwise nearly

equal, the great advantage on the score of safety from the sulphur water would give it an immense preference over its rival. Numerous cases present themselves, however, in which they are used in conjunction to great advantage. Where this becomes necessary, however, I have, as a general rule of practice, found it best not to continue the mercury longer than six or eight days; nor is it often necessary to use it continually during that period.

The effects of the *White Sulphur Water* upon the human body resemble mercury in several respects. Not to mention others, its resemblance is strikingly manifest from the fact of its producing *salivation* under certain peculiar circumstances. Another marked similarity may be mentioned, especially as it has a direct bearing upon the proper method of its administration: I allude to the existence of a phlogistic diathesis in individuals with whom either remedy is used. "When the system resists the specific action of mercury, it is a certain test that the inflammatory diathesis prevails to a considerable extent, and this is the cause of the resistance; for lessen the inflammatory diathesis by proper evacuations, and the specific action of the mercury will be readily induced." The system often offers the same resistance to the successful use of this water, which is evidently occasioned by the excess of the inflammatory diathesis, inasmuch as when the inflammatory disposition is abated by the lancet, purgatives, etc.,

the water promptly produces its wonted good effects. In the administration of the White Sulphur, it is of the utmost consequence to keep this practical fact constantly in view, and, by proper treatment, to keep down both general and local excitement.

Notwithstanding mineral waters are so well adapted to the cure of chronic diseases, it should not be expected that they will be uniformly successful; for it must be remembered that such diseases are only remediable when unconnected with alterations of organic tissue, which is their ultimate and mortal product. Nor is it reasonable to expect that any plan of treatment will succeed in all cases of chronic disease, unconnected with alteration of tissue; and I have accordingly found the methods recommended at times ineffectual, even when they were tried under circumstances which simply indicated disorder of the function, without any concomitant sign of disorganization.

Errors, and Abuse of Mineral Waters, etc. etc.—I have before alluded to some of the abuses of mineral waters by those who resort to them for relief; this subject, I conceive, may be still further pursued with profit to my readers. To one familiar with the many errors and mistakes committed in the use of mineral waters in this country, it is not wonderful that numbers return from visiting our most celebrated watering places, without having received any essential

benefit; it is rather a matter of surprise that so large an amount of good is achieved. The precautions in the use of such waters, deemed indispensable in France, Germany, and England, are greatly neglected here. There, the advice of a competent physician, who is well acquainted with the nature and peculiarities of the water, is thought so important, that persons rarely enter upon their use without such *advice*, and, at some places, are actually not *permitted* to do so. If similar precautions were more commonly adopted by visitors at our various watering places, a far larger amount of good would be achieved to the afflicted, much injury prevented, and the character of the several waters better established and preserved. It is a subject of daily and painful observation at all our principal watering places, to witness numerous individuals using mineral waters that are not adapted to their cases; and still more common is it to see those, to whose cases they are adapted, using them so improperly as entirely to prevent the good they would accomplish under a proper administration. Professor Mütter, of Philadelphia, makes the following judicious remarks when speaking of the use and abuse of mineral waters in this country: "Like every other remedy of any efficacy, mineral waters are liable to abuse, and it is really astonishing that such glaring errors should be daily committed, not only by the patients, but often by the *physicians* who recommend their

employment. It is by no means an uncommon occurrence (and those who have visited the springs of our country will bear me out in the statement I am about to make,) for an individual to arrive, furnished with a *'carte blanche,'* from a physician who has probably little or no knowledge of the active properties of the agent he recommends, to use the water as he may *see fit*, or with merely a charge to *'use it with caution.'* Others are sent without any direction whatever, in the hope that the water *may suit* their condition, and come trusting in Providence alone. Others, again, arrive with written instructions, to drink so many glasses of the water *per diem*, whether it agrees with them or not. Many patients do not take the advice of a physician at all, but, relying on the representations of those who have derived benefit, imagine that they, too, will be cured, although, in all probability, from the nature of their disease, the water may be the most prejudicial to which they could resort. Used in this careless and dangerous manner, is it to be wondered at, that so many individuals leave the springs, either not at all benefited, or in a worse condition than when they arrived?

The regulations which are thought necessary, and which are adopted in most European countries, especially France and Germany, during the use of a mineral water, are either unknown or neglected in this. There, nearly every spring is supplied with an experienced physician; one familiar with the cha-

racter of the water, whose duty it is to take charge of the sick as they arrive; here, with but one or two exceptions, those who frequent our watering places have to rely on *chance* for medical aid. Is this as it should be?"

A vague impression seems to pervade the public mind, that mineral waters, as medicinal agents, are totally unlike all other medicines, and that, in their administration, there is no necessity for observing any cautions, or for adopting extraneous expedients to procure the best effects of the agent employed. This is an error as injurious as it is common, and ought to be corrected in the public mind. Our more potent mineral waters ought indeed to be regularly incorporated into our *materia medica*, their several qualities properly defined, and the medical mind thus instructed to regard them, not only as valuable therapeutical agents, *per se*, but as agents capable of extensive and valuable modifications in their application to disease. A *pathological practice* should be established in relation to them, not less strict than in relation to the ordinary remedies of the shops, and the best means of influencing their sanative operations on the system understood.

The physician who desires to throw his patient under the *alterative* influence of mercury, is not so discouraged as to abandon the remedy, if it chance at first to run off by the bowels, and thus thwart his object; but either by changing the method of using

his medicine, or by uniting with it some soothing astringent, he ultimately effects the important object in view. Neither should the patient be discouraged in the use of a mineral water because it occasionally manifests a vagrant and improper effect; for facilities can be commanded to control its operations, as readily as we can control the improper operations of mercury. Such facilities may generally be found, either in an *increase* or *diminution* of the quantity taken—an alteration of the *periods* at which it has been taken—or, in the manner of using it, (where gases prevail,) in relation to its *gaseous* or *ungaseous* form. Occasionally, medical adjuvants are found necessary, and then I have been in the habit of using those most simple, and which least derange the animal economy.

As a general rule, I have found mineral waters most serviceable in those cases in which the stomach and general system tolerated them readily; yet such toleration depends so much upon the proper *preparation of the system*, and the manner of using the water, that the patient should by no means infer that it is unsuited to his case simply because it has manifested some improper operation in the commencement. For, as before intimated, it will often happen, that by changing the method of using the water, or by the administration of some appropriate adjuvant, the difficulty will be removed, and the agent afterwards act most pleasantly and profitably upon the system.

CHANGING FROM SPRING TO SPRING.

A very common error, in the use of Mineral Waters, is the belief that the patient should often change from one water to another, and that no one should be used longer than some given number of days, and this without any reference to its effects upon the system. This absurd notion leads many persons to fly from spring to spring, performing in a few weeks or days the circuit of the whole "*spring region*," and without remaining long enough at any one to receive permanent benefit. Now, if the position heretofore laid down be correct, that "mineral waters, like all other medicines, cure disease by exerting *effects* upon the animal economy," the impropriety will be obvious to all, of rapidly hastening from one fountain to another, without tarrying long enough at any to receive those *effects* upon the body which are necessary to a cure. Such a water-drinker acts like the "maid of all works," always busy, but accomplishing nothing.

What would be thought of the physician, who, having decided that his patient must undergo the influence of alterative action upon his system, and having put him upon a course of mercury to accomplish the object, should, just before this drug would have accomplished the end, discontinue its use, and put him upon iodine; and, just as this was about to

alterate the system, abandon it and substitute sarsaparilla; and thus, from one drug to another, running through the whole routine of alterative remedies, without giving any sufficient time to effect the object? This would surely be an absurd method of practice; and yet it would not be more absurd than the course we often see pursued by visitors at our springs,—who literally waste their whole time "in the mountains," and debar themselves of all permanent good, by spending their time rather *among* the springs, than at any one of them. The state of mind which leads invalids thus improperly to act, is often induced from the random opinions or injudicious advice of their fellow sufferers, whom they meet with at the various watering places. One will tell another that they have seen or heard of some person that was cured at once, at this, that, or the other spring. You will be assured by one, that the "White" is the place; by another, that the "Salt" is better suited to your case; a third informs you that you would do better at the "Blue;" while others will tell you there is nothing like the "Red," the "Sweet," the "Warm," the "Hot." Thus are the minds of persons frequently perplexed, until they come to the conclusion to "make the rounds" and try them all for a day or two. In this way the hapless invalid is often led to fritter away the whole time he remains in the mountains, without deriving permanent advantage from "*all the springs*," when, very pro-

bably, the time he had fruitlessly spent at them all would have been sufficient to have cured him at *any one of them.*

Let it be distinctly understood that these remarks are meant for the serious invalid only. Persons who visit the springs for amusement or pleasure, or those who come merely as a relaxation from business, and require only the tone which travel and mountain air can give, may, with great propriety, go from spring to spring, and spend their time just where they are the happiest. But for the invalid *who has something for the waters to do*, it is not so; he should first wisely determine which of the springs is best calculated to cure his disease, and having settled this important question, should persevere in the use of that particular water; carefully watching its effects, and "not be carried about by every wind of doctrine." If the appropriate agent for his case be the "Blue," the "Red," the "Salt," the "White," let him use it to the exclusion of all others, either until its inapplicability has been proven, or until it produces the specific effects which he desires. This being accomplished, there may be, and often is, a necessity for visiting other springs.*

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* See chap. iii., on "Prescribing Mineral Waters."

DRESS.

Delicate persons, visiting the mountains for health, should be particularly cautious on the subject of dress. It is rather more easy to dress with the ever-varying fashions, than to dress appropriately for *all the weather* that happens in our mountains during the "watering seasons." The weather is often so variable and uncertain as to make it a good general rule for the invalid to dress without reference to any particular state of it, but always warm and comfortable, with (in most cases) but little change from his dress in the spring season before he reached the mountains.

Some invalids will be benefited by constantly wearing soft flannel next the skin, not only because it keeps up a more uniform temperature than linen, but also because of the gentle excitement it occasions on the surface of the body. The best summer dress, however, which we have ever seen worn next the body,—and always a valuable *accompaniment of flannel*, winter and summer,—is *woven silk*. We are led to believe from experience, that silk, worn next the skin, is the very best protection we can command against the influence of cold. In *rheumatism* and *neuralgia*, a covering of woven silk is a valuable *remedy;* and for all delicate persons, and for those peculiarly susceptible to colds, it is a most invaluable

shield to the body. The superiority of silk over every other covering is probably owing to its peculiarity as a non-conductor of electricity; but whether this be so or not, is left to the astute medical philosopher to determine; it is sufficient for us to know the fact of its superior efficacy, without stopping to account for it.

Since the above paragraph was written, we have had ten years additional observation of the use of silk as a covering for delicate and susceptible persons; and the result is, that we are more than ever convinced of its great superiority. Indeed, such persons, while in our variable climate, and under the influence of sulphur waters, that increase the susceptibility of the system, cannot, by any other dress, so effectually secure themselves against the encroachment of colds, as by the use of silk sacks worn next the skin. Nor ought this precaution to be neglected by such, especially as the existence of a cold always renders the use of the waters less efficacious, and sometimes positively injurious, for the time it may continue.

DIET, EXERCISE, ETC.

Diet and exercise, during the use of mineral water, are of too much importance to be passed over without notice. It is to be regretted that so little as relates to diet is placed within the power of the invalid at

our watering places generally. Usually there is but one general system of living at all such places, and this invariably a system very illy adapted to the invalid.

Persons using mineral water may ordinarily indulge, in moderation, in that diet which they found to agree best with them at home. Imprudences as to the kind of food, or of excess in its quantity, should be as carefully avoided by the invalid while using such water, as when under treatment by other medical means. This, however, is by no means commonly the case.

Mineral waters generally remove acidity from the stomach and sharpen both the appetite and the digestion; hence it is often really difficult for the invalid to restrain himself at table, and we might be astonished to see the quantity and quality of food he sometimes consumes. Dyspeptics, as might be expected, suffer most from impropriety in diet: indeed, we are persuaded that more than half the good these waters would otherwise achieve in such cases, is prevented by impropriety in diet. But the evil of over and improper feeding, although most manifest in dyspeptics, is by no means confined to such. Upon the subject of diet Dr. Bell has well observed, that "slow and laborious digestion, heartburn, disordered kidneys, discoloration of the skin, and some affections of the liver, often the effects of excessive eating and drinking alone, are not to be readily cured by visiting mineral springs, and keeping up the same

kind of living." If they (and the remark applies to all invalids) be sincerely desirous of gaining health, they will most successfully do so by simplifying their regimen, and abstaining from all those appliances to force appetite and tickle the taste, which they had formerly used in the shape of ardent spirits, wine, and malt liquors, fried meats, pastry, and unripe fruits. In fine, we may sum up in a few words, by repeating, after the great father of medicine, that *all excesses are dangerous;* a maxim every one must have fully tested.

Eating much in the evening, sitting up late, prolonged and immoderate dancing, remaining too long in the cool air of the evening, are often the cause of many unpleasant complaints, which might have been easily prevented.

The passions are to be kept in check by avoiding every exciting cause, either of the boisterous or melancholy kind. A giddy chase after pleasure and luxurious indulgence, are scarcely more reprehensible than an indolent and secluded life. The kind and amount of exercise to be indulged in by the patient, must of course be regulated by the nature of his disease and the attendant circumstances; walking, riding on horseback or in a carriage, may be selected, as one or the other may be best adapted to the physical ability, and to the inclinations of the patient; but, in some form or other, all whose strength will admit of it should take regular exercise in good weather.

CHAPTER III.

USE OF MEDICINES AND OF DIFFERENT MINERAL WATERS.

THE judicious administration of mild and appropriate medicines in connection with the use of mineral waters, with the object of facilitating their operations upon the system, is often a matter of primary importance.

All writers who treat of mineral waters as medicinal agents, urge upon invalids the propriety of obtaining experienced medical advice before commencing their use, and allude to the occasional necessity of using medicines in connection with them in obstinate cases. But the circumstances under which medicines should be used, and the primary necessity of the practice in particular cases, has not always been as fully insisted on as the merits of such practice demand. This, we suppose, has been owing rather to the positions occupied by the various authors on mineral waters, than to any want on their part of a proper appreciation of the subject. A portion of such authors, although learned and scientific men, and highly distinguished in their pro-

fession, have not, nevertheless, had a large actual experience in the treatment of disease at mineral fountains, and with mineral waters. Hence the teachings of such have, very properly, been designed to show the value and adaptation of such agents as *independent* remedies, rather than as important adjuvants in particular cases; consequently they have treated of them in a somewhat isolated sense, and as they would have treated of any single article of the materia medica. The few who have written upon the subject, whose residence at mineral fountains has afforded enlarged opportunities for investigating the peculiar effects of the waters in individual and diversified cases, may, to some extent, have been restrained, by motives of delicacy, from enlarging upon this subject as fully as they should have done. Such authors, being settled as practitioners at the fountains of which they write, may not unnaturally have felt, that for them to urge upon the invalid visitor the necessity of medical advice and assistance, however important they might esteem it, and with however much of candor and disinterestedness they might do so, would possibly subject them to invidious reflections by the illiberal, or even from the discreet stranger, who, not fully appreciating the importance of the subject, might misapprehend their well-meant motives.

Many persons are disposed to regard mineral waters, in their curative powers, as a *panacea*, and,

like the much-extolled catholicons of the day, unaided by other appliances, and in despite of scientific directions and all the rules of art, adapted to cure all manner of diseases. We need scarcely say that such opinions, when entertained, are very erroneous, and that the judgment which regards them as important remedies in *nature's materia medica*, having indeed a wide and valuable scope of operation, but, like all other remedies, necessarily demanding various modifications and cautions in their use, would be far more correct and reliable.

Many consecutive years of experience, in the administration of mineral waters, have given us great confidence in their employment; indeed, we yield to no one in admiration of their happy adaptation for many ills to which flesh is heir. As *independent* remedies, totally disconnected with all other medicinal aid, they are often fully sufficient to attain the sanative end desired. So, too, we occasionally find a single article of the *materia medica*, unaided by other articles, capable of producing every beneficial effect that the case demands. Doubtless, like results occasionally take place from the employment of the various panaceas or catholicons of the age. But where we meet with one case in which a single article of the *materia medica*, or an artificial panacea, unaided by all other means, satisfactorily fulfills all indications of treatment in chronic disease, and results in effecting a cure, we meet with perhaps ten cases in

which adjunctive remedies should be employed. Be this as it may, however, in reference to the remedies just alluded to, we know it to be true of alterative mineral waters, not only as to the *certainty*, but especially as to the *celerity*, with which they effect cures in obstinate cases. This view of the subject is not only consonant with reason, but also with the general theories and teachings of the profession.

There is an opposite view of the subject, however, which alleges that any medical agent, adapted to the case, is sufficient of itself for the case, and should therefore stand unassisted by any other means. This theory, it will be perceived, leads necessarily into empiricism, and to the discarding of all science and discrimination in the use of remedies; and, consequently, ignores the value of all knowledge and experience in the profession.

Now, we admit that, if the selected agent be so fully and entirely adapted as really to fill every indication in the case, then the proposition we are combating is true,—and under such circumstances every judicious physician would say, *let it alone.* But such full and complete adaptations are but occasionally found to exist, either in medicines or mineral waters; and, in the use of the latter, even under ordinary happy *adaptations*, we often find a state of things that primarily existed, or has been superadded, that must be remedied by appropriate medicines, or the water, so far from proving benefi-

cial, will act injuriously. Besides, admitting the mineral water to be never so well adapted to the case in which it is being used, its slow progress in resolving congestions and in overcoming diseased action, may, in many cases, be greatly facilitated by judicious adjuvants, skillfully and timeously administered.

In obstinate cases in which it is desirable to procure the specific operations of a mineral water upon any organ, much time, to say the least, is saved by uniting with the water, for a few days, some *adjuvant* that *specifically determines to such organ.* By such a procedure, the water may be *invited* to the organ, and establish its action upon it much sooner than it would without such aid.

In diseases of the abdominal viscera generally, the patient may often economize a week or more of the time, which otherwise it would be necessary for him to use the water, by the proper introduction of some medical adjunct to the end that has been intimated. The milder mercurials, in connection with some of the vegetable purgatives, often answer exceedingly well in such cases.

The proportion of invalids, especially of such as are suffering with biliary derangements, that will derive increased benefit from the employment of mild alterative cathartics, to precede or accompany the use of alterative mineral waters, is as *ten to one at least;* and, in nine cases out of ten, the subject of biliary derangements will economize a week or ten

days, in the necessary use of such waters, by the occasional use of medicines.

Dr. John Bell, whom we always quote with pleasure, because of the profound thought he bestows upon any subject upon which he writes, remarks, that "it frequently happens that an invalid, whose state would be at first aggravated by drinking from a mineral spring, if nothing is premised, will, after the use of some active medicine, such as a few medicinal purges, and, if arterial action be somewhat considerable, the abstraction of some blood, be enabled to commence taking the waters, and persevere in their use with decided advantage." In other cases remedies of different kinds are recommended to second their action, and to be employed with them. Hoffman lavished the greatest eulogiums on milk with mineral waters. In the treatment of scrofula, Theophilus Bordeu obtained signal benefit by the union of mercurial frictions with the use of the waters of Bereges. But these, and other combinations, and alterations of treatment, can only be confidently recommended by physicians always residing at the springs, and intimately acquainted with all their shades of action and operation. The general rule, which may with safety be laid down for the guidance of those about to use mineral waters, is to have their *primæ viæ* well cleansed of fæcal and mucous collections, and to bring down, as near as may be, the circulation to a natural standard.

A medical rule, in attempting the cure of disease, is to subdue inordinate and evident disturbance of the system before we administer medicines with a view to their peculiar effect. Thus, when the stomach and bowels are highly irritable, or inflamed, we decline administering purgatives; when there is acute pain in the head, with high fever, we withhold opium and other remedies, of what are termed the class of anodynes; when the liver is acutely inflamed, we are wary in giving anti-bilious medicines, so called. Violent and regularly recurring chills do not justify the use of the barks, if the interval be marked by symptoms of high action of the blood-vessel system generally, or of great determination to the head, liver, or stomach. All these several states of violent disease are to be mitigated, at first, by bleeding, either general, as from the arm, or local, as by cups and leeches, to the head, over the stomach, etc.; also, by simple cool diluents, or watery drinks, cool air, and, under appropriate circumstances, the cold bath. Without preliminary treatment, purgatives would, so far from carrying off matters oppressive to the stomach and bowels, and promoting secretions from their inner surfaces, only serve still further to irritate and inflame these parts; opiates would increase the pain in the head and restlessness, and even cause delirium; bark would convert the remittent into more of a continual fever, and increase the distress of the stomach, and exasperate the prior existing pain in the liver.

From these and other analogous facts we learn the important truth, overlooked by the public generally, and sneered at by impudent quacks, that the operations and remedial effects of any one medicine, or combination of medicines, *are purely relative, and depend on the state of the animal economy at the time.* These views should be carefully borne in mind, as well in the administration of mineral waters as of the ordinary remedies of the apothecary's shop.

We desire not to be misunderstood, however, as expressing the opinion, that medicines are always necessary, in ordinary cases submitted to the use of mineral waters.

When the powers of the water are sufficient to answer, with tolerable certainty and celerity, the sanative indications, it is safe, and generally proper, to withhold medical means altogether; or, if occasionally any should be demanded, to employ such only as are mild and suasive in their character.

PRESCRIBING MINERAL WATERS.

The medical adviser at all our popular watering places has, necessarily, very delicate and responsible duties devolved upon him. To some extent, he must be the recipient, in a professional point of view, of the confidence of the invalid stranger who has left a distant home, to seek at medicinal fountains the best

remedy for the maladies of which he hopes to be relieved. This confidence, while it is agreeable to the honorable mind, is not without onerous responsibility.

A sufficient knowledge of our various mineral springs, to enable the medical adviser to judge correctly of their specific character and adaptations, unfolds at once to him a wide field for the exercise of skill and judgment, in selecting for his patient the one best adapted to the nature and wants of his case.

In the Virginia Spring region, we are surrounded by a perfect galaxy of mineral fountains, of almost every variety and adaptation. We have the *Sulphur* waters, in their various modifications; we have the *Chalybeates*, simple and compound, in great variety; the *Saline*, in several varieties; the *Aluminous*, or acidulated aluminous chalybeates, in three or four varieties; and *thermal* waters of every temperature, from 62° to 106°. All these fountains of healing, with their varied modified influences, (for each one differs in some essential particulars from all the others,) should be regarded as so many different articles in nature's *materia medica;* each possessing adaptations somewhat peculiar to itself, for the different diseases or states of the system. Here, then, is a wide range for the medical adviser, and his tact and success, in advising most wisely, will necessarily depend upon his acquaintance with the peculiar qualities and specific effects of all these different agents.

Again, such an adviser, to be most useful to his patients must be careful not to be influenced by his *loco personæ*, or to regard the particular fountain over whose medical direction he presides, as a *catholicon*, and adapted better than any other to all sorts and conditions of cases. A medical adviser, at a mineral fountain, could not well fall into a greater error, or more clearly evidence a want of wise discrimination, than in finding his remedy, in all cases, in the particular agent which he immediately directs; for, in the nature of things, such universal preference would often be misplaced. Standing in the delicate relation which such an adviser holds to the invalid public, he must regard the various mineral agencies around him somewhat in the same light in which he regards the various medicines of the apothecary's shop, and should wisely and freely choose among them for the use and benefit of his patients. Any other course would be empirical,—hazardous to the best interest of the unfortunate invalid, and utterly unworthy of his confidence.

Under such proper and discriminating advice, the patient will often, perhaps in a majority of cases, be led in the course of his cure to the use of several of the different fountains. The same water, however potent it may be, is not always, nor even generally, sufficient to meet all the indications that exist in the case, and, unaided, to produce a perfect cure. There is nothing more common than the certainty

with which a particular water accomplishes particular results upon the animal economy, while it fails to accomplish other results that will be readily achieved by other and dissimilar waters. For instance, while the waters of the White Sulphur Springs are well adapted to produce alterative effects upon the secretory organs, and, by their general emulging and changing influences, to bring the system into a natural or physiological type,—actions and influences that are primary in their importance, and essential to a cure; this being accomplished, some of the more *tonic and nervine waters*, the Alum, the Sweet, or the Red Sweet, for instance, will be found far better adapted to strengthen the animal fibre, and to complete the cure.

So of all the other waters, the Alleghany, the Alum, the Salt, the Red, the Hot, the Healing; indeed, our whole catalogue of springs have each its sphere of usefulness, that must not be overlooked by the discriminating adviser, in the treatment of particular cases; and hence they all should be arrayed and labeled, as it were, in nature's great laboratory, and prescribed intelligently, and as their use is indicated in the variety of diseases that are sought to be healed by such agents.

CHAPTER IV.

WHITE SULPHUR SPRINGS.

Location and General Physical Characteristics—Its Strength uniformly the same—Does not lose its Strength by parting with its Gas—Does not Deposit its Salts when Quiescent—Its Gas fatal to Fish—Its Early History—Known to the Indians as a "Medicine Water"—First used by the Whites in 1778—Progress of Improvements and Present Condition—Analyses of Mr. Hayes and Professor Rogers.

THE White Sulphur Springs are located in the County of Greenbrier, Virginia, on Howard's Creek, and on the immediate confines of the "Great Western Valley," being but six miles west of the Alleghany chain of mountains, which separates the waters that flow into the Chesapeake Bay from those which run into the Gulf of Mexico.

The waters of the spring find their way into Howard's Creek two hundred yards from their source, which, after flowing five miles, empties into Greenbrier River.

The spring is situated on an elevated and beautifully picturesque valley, hemmed in by mountains on every side. *Kate's Mountain*, celebrated as the

theatre of the exploits of a chivalrous heroine in the days of Indian troubles, is in full view, and about two miles to the south; to the west, and distant from one to two miles, are the *Greenbrier Mountains;* while the towering *Alleghany*, in all its grandeur, is found six miles to the north and east.

This spring is in the midst of the celebrated "Spring Region," having the "Hot Spring" thirty-five miles to the north; the "Sweet," seventeen miles to the east; the "Salt," and "Red," the one twenty-four, the other forty-one miles, to the south; and the "Blue," twenty-two miles to the west. Its latitude is about 37½° north, and its longitude 3½° west from Washington. Its elevation above tide-water is two thousand feet. It bursts with unusual boldness from rock-lined apertures, and is inclosed by marble casements five feet square and three and a half feet deep. Its *temperature* is 62° of Fahrenheit, and remains uniformly the same during the winter's blasts and the summer's heat; any apparent variation from this temperature will be found, I think, to be owing to the difference in thermometers, as repeated trials with the same instrument prove the temperature to be uniform.

The principal spring yields about thirty gallons per minute; and it is a remarkable fact that this quantity is not perceptibly increased or diminished during the longest spells of wet or dry weather; while other bold springs of the country have failed

during the long droughts of summer, this has invariably observed "the even tenor of its way." There is no discoloration of the water during long wet spells, or other evidences that it becomes blended with common water percolating through the earth. The quantity and temperature of this spring being uniform under all circumstances, gives a confidence, which experience in its use has verified, of its uniform strength and efficiency. The water is most clear and transparent, and deposits copiously, as it flows over a rough and uneven surface, a *white*, and sometimes, under peculiar circumstances, a *red* and *black*, precipitate, composed in part of its saline ingredients. Its *taste* and *smell*, fresh at the spring, are that of all waters strongly impregnated with sulphuretted hydrogen gas. When removed from the spring, and kept in an open vessel for a sufficient length of time for this gas to escape, or, when it has been *heated* or frozen for this purpose, it becomes essentially *tasteless*, and *inodorous*, and could scarcely be distinguished, either by smell or taste, from common limestone water. Its cathartic activity, however, is rather increased than diminished when thus insipid and inodorous.* It does not lose its transparency by parting with its gas, as many other waters do; nor does it deposit its salts in the slightest degree when qui-

* See chap. v., on "*The relative virtues of the saline and gaseous contents of the White Sulphur water.*"

escent, not even sufficiently to stain a glass vessel in which it may be kept.

The *gas* of this spring is speedily fatal to all animals, when immersed even for a very short time in its waters. Small fish thus circumstanced, survive but a few moments, first manifesting entire derangement, with great distress, and uniformly die in less than three minutes.

The springs are surrounded with mountain scenery of great beauty, and blessed with a most delightful climate in summer and fall. Independent of the benefit that may be derived from the waters, a better situation for the invalid during the summer months can scarcely be imagined. They have the advantage of a salubrious and invigorating air and an agreeable temperature,—cool at morning and evening, the thermometer ranging at those periods during the summer, between 50° and 60°, and rarely attaining a greater height than 80° at any time of the day,—with an elasticity in the atmosphere that prevents the heat from being at any time oppressive, and enabling the invalid to take exercise in the open air during the day, without fatigue.

There is but little in the early history of this watering place especially worthy of preservation.

Tradition says that the charming valley, in which it is situated, was once a favorite "*hunting-ground*" of the proud *Shawanees*, who then owned and occupied this fair region, and the numerous ancient

graves and rude implements of the chase, that are found in various parts of the valley, sufficiently attest the truth of this legend. That a small marsh, originally contiguous to the spring, was once a favorite deer and buffalo "lick," is well known to the oldest white settlers in the country; and it is confidently asserted by some of that venerable class, that the spring was known to the Indians as a "*medicine water*," and that since their migration across the Ohio, they have occasionally been known to visit it for the relief of rheumatic affections. Whether this legend be truth or fiction, I cannot avouch; authentic history, however, abundantly testifies to the reluctance with which its ancient owners abandoned this lovely valley, to the rapacious avarice of the invading white man.

During the year 1774, the proud, but ill-fated Shawanees, being overpowered by the encroaching colonists from Eastern Virginia, and having sustained, in October of that year, a signal defeat by the colonial troops, at Point Pleasant, were forced finally to abandon their country, and seek shelter and protection with the main body of their tribe, then living on the waters of the great Scioto; not, however, until, by frequent battles and midnight murders, they had testified their attachment to their ancient hunting-grounds and the graves of their fathers.

The property on which this spring is situated was

originally patented to Nathan Carpenter, one of the earliest pioneers of the country, who was subsequently killed by a band of marauding Indians, at a fort at the mouth of Dunlap's Creek, near where the town of Covington now stands.

The precise time at which this spring, now so celebrated among mineral waters, was first used for the cure of disease, cannot be ascertained with absolute certainty. It is believed, however, that a Mrs. Anderson, the wife of one of the oldest settlers, was the first white person who tested its virtues as a medicine.

In 1778, this lady, being afflicted with rheumatism, was borne on a litter, from her residence, ten or fifteen miles, to the spring, where a tent was spread for her protection from the weather; and a "*bathing tub*" provided, by felling and excavating a huge tree that grew hard by. Here she remained until she entirely recovered, drinking from the fountain, and bathing in the water previously heated in the trough by "hot rocks." It is reasonable to suppose that the fame of this cure spread abroad among the "settlers," and from them into Eastern Virginia, and among the few "spring-going folks," who then annually visited the Sweet Springs, not many miles distant. Accordingly, in 1779, and from that to 1783, there were annually a few visitors here, who spread their tents near the spring, no house having then been erected, and with the rude "trough" for a bath-

ing tub, and this protection from the weather, are reported to have spent their time most agreeably and profitably. Some of these primitive visitors, "who dwelt in tents," have visited the springs of late years, and, with pleasurable emotions, marked out the spot where their tents stood some sixty years ago, while they recounted with delight the amusements and pleasures they then enjoyed.

In 1784, 1785, and 1786, numerous "log-cabins" were erected, not where any of the present buildings stand, but immediately around the spring, not one of which, or the materials which composed it, is now remaining.

Mr. Caldwell, until recently, the proprietor of the property, came into possession of it in the year 1808, but did not personally undertake its improvement until the summer of 1818. Before this period, the buildings for the accommodation of visitors, although sufficient for the number that then resorted to the place, were exceedingly rude, being altogether small wooden huts. The interest and enterprise of the owner soon led him into a different and more appropriate system of improvement, and from small beginnings, he went on, progressing in the rapid ratio of demand, until from the "tent" accommodations in 1779, and the "log-cabins" in 1784, the place now, both in elegance and extent, exhibits the appearance of a neat and flourishing village, affording comfortable and

convenient accommodations, (including the surrounding hotels,) for two thousand persons.*

ANALYSIS.

In the winter of 1842, Mr. Augustus A. Hayes, of Massachusetts, made an analysis of the White Sulphur water, at his laboratory in Roxbury, from a few bottles of water forwarded to him from the spring in the preceding fall. The following is the result of his examinations:—

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* In the spring of 1857, the White Sulphur property was sold to a company of gentlemen residing principally in Virginia, who (in virtue of an act of the Legislature) have associated themselves into a *Joint-stock company*, under the name of the "*White Sulphur Springs Company*." The energy and public spirit of the individuals who compose the Company, give abundant evidence to the numerous friends of the property, that nothing that taste or enterprise can effect, in its extension and adornment, will be overlooked or long delayed. The Company has already erected the largest building in the Southern country, its dimensions being *four hundred feet long*, by a corresponding width, and covering an acre of ground. This immense structure is of brick; and is appropriated for *receiving-rooms*, *dining-room*, *ball-room*, *parlors*, *lodging-rooms*, etc. etc. They have also built numerous *Cottages*, for families. With these improvements, together with a new and capacious *Bathing establishment*, and the removal of many of the old buildings to new localities, by which the Lawns are enlarged and adorned, the property, alike in capacity, in convenience, and in the elegance of its arrangements, exhibits a new and generally improved appearance.

"Compared with pure water free from air, its specific gravity is 1·00254.

"50,000 grains (about seven pints) of this water contain, in solution, 8·633 water grain measures of gaseous matter, or about 1·14 of its volume, consisting of—

Nitrogen gas	1·013
Oxygen gas	·108
Carbonic acid	2·444
Hydro-sulphuric acid	·68
	8·633

"One gallon, or 237 cubic inches of the water contain 16 739-1000 cubic inches of gas, having the proportion of—

Nitrogen gas	4·680
Oxygen gas	·498
Carbonic acid	11·290
Hydro-sulphuric acid	·271
	16·739

"50,000 grains of this water, contain 115 735-1000 grains of saline matter, consisting of—

Sulphate of lime	67·168
Sulphate of magnesia	30·864
Chloride of magnesium	·859
Carbonate of lime	6·060
Organic matter (dried at 212° F.)	8·740
Carbonic acid	4·584
Silicates (silica 1·84, potash ·18, soda ·66, magnesia and a trace of oxyd. iron)	2·960
	115·735

"Unlike saline sulphuretted waters generally, this water contains a minute proportion of chlorine only, the sulphates of lime and magnesia forming nearly ten-elevenths of the saline matter.

"The alkaline bases are also in very small proportion, and seem to be united to the silicious earths, in combination with a peculiar organic matter. The organic matter, in its physical and chemical character, resembles that found in the water of the Red Sulphur Springs, and differs essentially from the organic matter of some thermal waters.

"In ascertaining its weight, it was rendered dry at the temperature of 212° F. When dry, it is a grayish-white, translucent solid. When recently separated from a fluid containing it, it appears as a thin jelly or mucilage, and gives to a large bulk of fluid a mucouslike appearance, with the property of frothing by agitation. It unites with metallic oxydes and forms compounds both soluble and insoluble. In most cases an excess of base renders the compound insoluble. The compound with oxyde of silver is soluble in water; with baryta and lime it does not form a precipitate, while magnesia forms with it a hydrous white, gelatinous mass. In acids it dissolves; the oxy-acids do not change its composition, while they are diluted and cold; by boiling they produce sulphuric acid from its constituent sulphur, and change its carbon to other forms. In contact with earthy sulphates at a moderate temperature, it produces hydro-sulphuric acid,

and to this source that acid contained in the water may be traced. This substance does not rapidly attract oxygen from the atmosphere, and from colored compounds, as some other organic compounds do. The proportion of organic matter, like that usually contained in our waters, is in this water very small; until forty-nine fiftieths of the bulk of a quantity is evaporated, the residual matter does not become colored, and, when the saline residue is dried, it is of a pale yellow.

"The medicinal properties of this water are probably due to the action of this organic substance. The hydro-sulphuric acid, resulting from its natural action, is one of the most active substances within the reach of physicians, *and there are chemical reasons for supposing that, after the water has reached the stomach, similar changes, accompanied by the product of hydro-sulphuric acid, take place.**

"Substances, having characters similar to those presented by this matter, have been classed with the lower order of living plants. With such matters, this substance does not belong, in the state in which it is found in the water, for it there forms compounds, the result of chemical affinities, wholly incompatible with vital action. In its altered state, produced by atmospheric agencies, it may nourish

* See chap. v., on "*The relative virtues of the saline and gaseous contents of the White Sulphur water.*"

plants and develop the growth of seeds fitted to such a soil as its elements form."

Professor William B. Rogers has also analyzed this water. The following is the result of his examinations:—

Solid matter, procured by evaporation from 100 cubic inches of White Sulphur water, weighed after being dried at 212°, 65·54 grains.

Quantity of each solid ingredient in 100 cubic inches, estimated as perfectly free from water:—

Sulphate of lime	31·680	grains.
Sulphate of magnesia	8·241	"
Sulphate of soda	4·050	"
Carbonate of lime	1·530	"
Carbonate of magnesia	0·506	"
Chloride of magnesium	0·071	"
Chloride of calcium	0·010	"
Chloride of sodium	0·226	"
Proto-sulphate of iron	0·069	"
Sulphate of aluminæ	0·012	"
Earthy phosphates	a trace	"
Azotized organic matter blended with a large proportion of sulphur, about	5	"
Iodine, combined with sodium or magnesium.		

Volume of each of the gases in a free state, contained in 100 cubic inches:*

Sulphuretted hydrogen	0·00 to 1·80 cubic inches.
Nitrogen	1·88
Oxygen	0·19
Carbonic acid	8·67

* 100 cubic inches amounts to about 3½ pints.

CHAPTER V.

THE RELATIVE VIRTUES OF THE SALINE AND GASEOUS CONTENTS OF THE WHITE SULPHUR WATER.

SPECULATION has existed as to the relative efficacy of the different component parts of the White Sulphur water in the cure of disease, and while some have supposed that its *gaseous contents* are essential to its sanative virtues, others, and we think the best informed observers, attributé its medicinal virtues mainly to its *solid* or *saline contents*. To the latter opinion the able Professor of Natural Philosophy in the University of Virginia, who has carefully examined the water, and other distinguished chemists and physicians, decidedly incline.

It certainly is a question of interest to the valetudinarian, whether he should use this water fresh as it flows from the spring, abounding in all its stimulating gas, or, whether he should use it after it has *partially* or *entirely* parted with this gas. To this subject we have, for the last several years, devoted particular attention, having instituted, with care, various and diversified experiments, in order to establish something like definite and positive conclusions.

Although the value of this water in what is usually termed its *non-stimulating form*, or, in other words, when deprived of its gas, has long been known to many who are familiar with its use, it was not until the last few years that it was commonly used from choice, after it had been long removed from the spring, or, from any cause, had parted with its gaseous contents; and an opinion, the correctness of which had never been examined, prevailed in the minds of many, that in losing its gas, it lost its strength and efficacy.

Having settled at the "White," as the resident physician of the place, it became alike our duty and our interest to investigate the character and operations of its waters, under every possible form and modification in which they could be presented. In the pursuit of this duty, we resolved to take no opinion upon "trust," but carefully to examine and investigate for ourselves. A prominent question immediately presented itself for inquiry, involving the relative merits which the *solid* and *gaseous* ingredients of the water possess as remedial agents. It would be tedious, and, to many, uninteresting, to detail the several steps and multiplied experiments which led us to conclusions upon the subject, satisfactory to our own mind, and upon which we have established certain practical principles in the use of the water, which have enabled us to prescribe it, especially for *nervous* and *excitable patients*, with far

greater success than heretofore. It is sufficient for our purpose at present to state, that while we freely admit that the *gas*, which abounds in the water, is an active *nervine stimulant*, and therefore may be a most potent agent in some cases, we are, nevertheless, to look mainly to the *solid contents* of the water for its *alterative* power, as well as for its activity manifested through the emunctories of the body.

Whether the efficacy of the solid contents be owing to the specific character of any one, or to all of the *thirteen different salts* of which it is composed, and which exist in the water in the most minute form of subdivision, and in this condition enter the circulation, and course through the whole system, applying themselves to the diseased tissues; or, whether its efficacy to some extent, depends upon the *evolution* of sulphuretted hydrogen gas, *after the water has reached the stomach*, is a matter of curious inquiry.

The distinguished chemist, Mr. Hayes, of Roxbury, after having bestowed much pains in analyzing the water, and in studying its peculiar character, comes to the following conclusions as to the source of its medicinal power. After describing, at considerable length, a certain matter which he found to abound in it, and which he terms "*organic matter*," in the course of which he says, "it differs essentially from the organic matter of some thermal waters," he proceeds to say: "In contact with earthy sulphates, at a moderate temperature, it produces hydro-

sulphuric acid, *and to this source that acid contained in the water may be traced.* This substance does not rapidly attract oxygen from the atmosphere, and from colored compounds, as some other organic compounds do,—*the medicinal properties of this water are probably due to the action of this organic substance.* The hydro-sulphuric acid resulting from its natural action, is one of the most active substances within the reach of physicians. *There are chemical reasons for supposing that, after the water has reached the stomach, similar changes, accompanied by the production of hydro-sulphuric acid, take place."**

Before Mr. Hayes had communicated the above opinion, growing out of his chemical examinations, we had again and again been much interested with certain phenomena which we have termed the *secondary formation* of gas in the White Sulphur water. Instances had frequently been reported to us of the water having been put into bottles after it had *lost its gas entirely*, being void both of taste and smell, and yet, after these bottles were kept for some days in a warm situation, and then opened, the water appeared equally strong of the hydro-sulphuric acid, as it is found to be, fresh at the fountain.

In a shipment of this water to *Calcutta*, some years since, the "Transporting Company" had the

* See Hayes's Analysis, chapter iv.

water bottled in Boston, from barrels that had been filled at the spring six months before. The water, although *tasteless and inodorous*, when put into the bottles at Boston, was found, on its arrival at Calcutta, so strongly impregnated with the hydro-sulphuric acid as to render it necessary, under the direction of an intelligent gentleman of Boston, (who had witnessed this secondary formation of gas before,) to uncork the bottles for some time before using, that the excess of gas might escape.

We had, also, known that in the process of *thawing* sulphur water, that had been previously frozen, sulphuretted hydrogen gas is evolved; for, although the ice has neither the taste nor smell of sulphur, a strong smell of sulphuretted hydrogen is manifest as the ice is returning to water.

We had often observed that individuals who drank the water entirely *stale*, and void alike of *taste* and *smell*, were as liable to have eructations of sulphuretted hydrogen as those who drank it fresh at the fountain. These, and other facts connected with the peculiar operations and effects of the water, when used in its ungaseous form—operations and effects which it is not necessary here to refer to, but all going to prove the *secondary* formation of gas under certain circumstances—had, in our investigations of this water, interested us exceedingly, and consequently, we were not a little pleased that Mr. Hayes's chemical examinations so fully sustained the opinions

we had been led to entertain from our personal observation.

This opinion of Mr. Hayes, in connection with the numerous proofs derived from analogy and observation, of the *secondary* formation of sulphuretted hydrogen gas in the water, would seem to be calculated to harmonize the opinion advanced by us, of the *equal efficacy* of the water when deprived of its gas, with the sentiment entertained by some, that the hydrogen gas is essential to its sanative operations.

The phenomena of a *secondary formation* of sulphuretted hydrogen gas in mineral waters, has not, that we are aware of, been noticed before; it certainly has not been in relation to the White Sulphur, and we hope that medical gentlemen, generally, who may have occasion to use such waters, will direct attention to this singular fact. For ourselves, we promise still further to investigate the subject, and may, at some subsequent period, lay the results of our investigations before the medical public.

Our investigations, of the relative virtues of the gaseous and saline contents of this water, have satisfied us that the physician, in making up his judgment as to the best method of administering it in particular cases, may always properly moot the propriety of using it, *fresh* as it flows from the spring, *deprived of its gas*, or with *modified quantities*. He should bear in mind, that there are cases in which it is preferable that the water should be used *stale*, and

that, by depriving it in *whole* or in *part* of its gas, he can graduate that amount of stimulus to the system, which it may demand, and this, in most cases, without lessening the *actively operative* or *alterative* effects of the water.

For some patients, the White Sulphur, as it flows from the spring, is too *stimulating*, and hence, before the *non-stimulating* method of using it was introduced, many such patients left the spring, either without giving the water a trial, or actually rendered worse by its stimulating influence. This class of persons can now use the water *when deprived of its gas*, not only with impunity, but often with the happiest results. Numerous cures, effected by its use in the last ten or fifteen years, have been in that class of patients by whom the water, *fresh at the spring*, could not have been used without injury. The cases of Mr. Morton, of Mississippi, and J. L. Jernagan, Esq., reported at large in a pamphlet published in 1841, are pertinent examples of such cases.

In cases of nervous persons, and especially in those whose *brain* is prone to undue excitement, we have often found it necessary, either by *freezing* or *heating* the water, to throw off its gas completely, before it could be tolerated by the system; and some of the happiest results we have ever witnessed from the use of the water, have been achieved by it after being thus *prepared*. The cases of Mrs. H., of

Georgia, and of Mr. B., of Massachusetts,* the one afflicted with disease of the stomach and chest, the other with chronic inflammation of the brain, are instances, among scores of others that might be referred to. But this is not all. With the view of guarding effectually against errors that might arise from a defect in our own observations, we procured the assistance of several physicians, and other intelligent gentlemen, all of whom were familiar with the operations and effects of the water when drunk fresh at the spring, and who, with the view of testing the facts we have mentioned, used it themselves, and gave it to others, *after it had been long removed from the spring*, and with the same results that they had previously experienced in their own persons, or witnessed in others, from like quantities of the *fresh* water, abounding in its gas.

Our object in prescribing White Sulphur has been to pursue a discriminating or *pathological* practice. We regard it as an active and potent *medicine*, and believe that, like all such medicines, it should be used with a wise reference to the nature of the case, and the state of the system. *We must not be understood as advancing the opinion, that this water is always to be preferred after the escape of its gas.* We entertain no such opinion; on the contrary, for a large class of visitors, we think it preferable that

* Reported at large in a pamphlet published in 1841.

they should avail themselves of the use of the water either at, or recently removed from, the fountain, and as it naturally abounds in its gases. There are other cases in which the exciting influence of the gas can only be borne *in a more limited degree*, and, for such, we permit its *partial escape* before using it, while in a numerous class of cases, (and especially on first commencing the use of the water,) we esteem it indispensable to its quick and beneficial operation, that its *uncombined gas*, which gives *taste* and *smell*, should have escaped.

In recommending the White Sulphur, then, to the use of the invalid, we esteem it quite as necessary to investigate the manner of using, as relates to its *fresh* or *stale* quality, as it is in reference to its dose, or the times of administering it; and for neither would we lay down positive and absolute rules in advance; for each case must, in the nature of things, give rules for its own government.*

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* It is now more than twenty years since the author first called public attention to the importance, indeed, the absolute necessity, in many cases, of the invalid's using this water in its *ungaseous* or *least* stimulating form.

Like all innovations upon old opinions and customs, it met with its hasty objectors, at first, but actual experience was not long in establishing the soundness and value of the recommendation,—and now, we have the gratification to know that it is regarded, by all well-informed persons, as a *fixed principle* in the use of the water, that, to be used safely and most

The great value of this water, as a therapeutical agent, to a large class of persons who visit the fountain, is a fact alike unquestioned and unquestionable. That in its natural condition, as it flows from the bosom of the earth, it is happily adapted to numerous cases of disease, is a truth established by upwards of sixty years' experience, as well as fully sustained by the numerous cures that are constantly occurring. The great value of the water, then, fresh as it flows from the spring, and abounding in its gas, is a truth, so far as we know, that is *unassailed*, and which, *we* believe, is *unassailable*. Nevertheless, that there are many cases in which the gas is not beneficial, *in the amount* in which it exists in the fresh water, is a fact, which our experience enables us to assert with the utmost confidence. That the water, in such cases, therefore, is better without its gas than with it, follows as effect follows cause. But we do not teach that the water, *per se*, and without reference to cases, should always be preferred without its gas. We base not our practice upon any such narrow and exclusive views; nor do we deny the value of the agency of the gas in appropriate cases.

We, then, regard the *solid contents* of the White Sulphur water, either in its direct or indirect influ-

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beneficially, in very many cases, it must be used with strict reference to its *fresh* or *stale* quality; or, in other words, to its *stimulating* or *non-stimulating* effects.

ences, as the *main* agency in its medicinal efficacy. Whether the *efficacy* of the salts of the water be owing to their absorption into the system as such, or whether it depends upon the *secondary formation* of hydro-sulphuric acid gas in the stomach, or whether it ought to be ascribed to the combination of these different agencies, we leave for others more fond of speculation to decide. We have, heretofore, been satisfied with the *knowledge* of the efficacy of the solid contents, without much theorizing to explain the *why* and *wherefore*.

But, it may be asked, if the gas does good in the state of a *secondary formation* in the stomach, would not a larger quantity, taken with the fresh water, do more good? We reply, that this by no means follows in that class of cases for which we specially advise the ungaseous water; for our only objection to the fresh water, in such cases, is, that it has *too much gas*. Admitting that the gas may exert an influence, we allege that in nervous and excitable cases the quantity is not only better adapted to the system, but that any given quantity, under a *secondary formation*, excites the system less, from its gradual formation in the stomach, than if suddenly received in volume into that *viscus*.

Nor do we, because we recommend the ungaseous water in *particular cases*, repudiate and disallow all medicinal agency of the gas, as a general principle? Not at all. We simply contend that, *for the treat-*

ment of certain cases, there is *more of the stimulating gas* in the fresh water than such cases can bear with advantage, and that its excessive excitation in such cases would be prejudicial instead of beneficial.

But do we find it necessary to guard the amount of gas for every water drinker? or in effect to erect a bed of *Procrustes*, and oblige every one to conform to its length? By no means. A. arrives at the springs, not much debilitated by disease, and with a firm, nervous, and muscular system; there is no excessive excitability in his case, and neither his cerebral, nervous, nor vascular system is particularly prone to be affected by stimulants or exciting medicines. We advise him to use the water *as it flows from the fountain*, and if he should, contrary to expectation, find that it stimulates him unpleasantly, to set it by for a short time before using.

B. calls for advice as to the manner of using the water; his *temperament*, and the state of his cerebral, nervous, and vascular system is the opposite of A.'s; his physical energies have been prostrated by disease; his nerves are *unstrung*, and, like his brain, prone to be painfully affected by stimulants or exciting medicines. We advise him to use the water after it has, either *partially* or *entirely*, parted with its gas; that is, after it has been set by for *twelve* or *eighteen hours*, as the delicacy and excitability of his system demand.

In cases of inflammation of the *parenchyma* of the

brain, and in other highly excitable conditions of the cerebral or nervous system, we have the water more carefully prepared, either by heating or freezing it. We have a case at this time under treatment, in the person of Mrs. F., in which there is such an extreme susceptibility of the brain, that absolute derangement, for several hours, was the consequence, in several instances, of taking two glasses of the water fresh from the spring; although she bears with impunity, and is improving rapidly, under *prepared* water.

In graduating the amount of stimulus, or, if the gaseous theorist please, the amount of medical material to the wants of the system—in other words, *varying our prescription to suit the case*—are we departing from a scientific and approved system of practice? What would be thought of the science of a medical man, who invariably used either the same medicine, or the same dose of any medicine, without regard to the peculiarities or constitution of his patients? Just what ought to be thought of us, or any one, who would direct so potent an agent as White Sulphur water to be used alike in every variety of constitution and disease.

A popular error, in relation to mineral waters, is that they exert a sort of mysterious influence on the system; and that, as nature has elaborated them in the bowels of the earth, they are, therefore, formed in the best possible manner for the cure of disease.

This opinion is not more reasonable than it would be to suppose that nature has formed *antimony* in the best possible form, for the cure of disease, although we know that in this form, under the administration of the celebrated Basil Valentine, it slew all the *monks* in his cloister.

Like all other remedial agents, potent mineral waters produce certain *effects* upon the animal economy, and these *effects* will be beneficial or injurious, as the remedy is properly or improperly employed. For instance, C., who is nervous, delicate, and excitable, and is affected with functional derangement of the organs, requires to receive, for a certain time, the influence of a mineral water, which, while it acts as an aperient upon his bowels, enters his circulation, courses through his system, and *alterates* his deranged organs; being, at the same time, so bland and unstimulating in its general effects, as not to arouse any one, or a series of organs into undue excitement and rebellion against the common good. Such a remedy is found in the *stale* and *ungaseous* White Sulphur-water.

D. requires the very same effects to be exerted upon his diseased organs,—but he is of very different temperament and constitution. His brain and nerves are prone to no unnatural excitement, and he is unaffected with the thousand physical sensibilities to which C. is subject. D. may take the White Sulphur

water with impunity and advantage, in any manner most agreeable to him. In his case its exciting gas constitutes no objection to its use. The good effects of the water, so differently used by C. and D., will be the same, *because the difference in their cases makes the difference in the use of the remedy.*

CHAPTER VI.

UNIFORMITY IN THE QUALITY OF THE WHITE SULPHUR—LIABILITY TO ERROR, BY RELYING ON SOME OF THE ASSUMED TESTS OF THE VALUE OF SULPHUR WATERS.

THE White Sulphur water is uniform in its saline strength; that is, it contains in a given quantity, at all seasons, the same amount of solid contents. Of this fact I am fully satisfied, from repeated tests and examinations of it, under various circumstances, and for many years. It exhibits occasional and slight variations in the amount of its free sulphuretted hydrogen gas. This variation is occasioned mainly, if not entirely, by the condition of the atmosphere at the time—and, principally, by its electrical condition. Even this variation in the water, however, is more apparent than real, and is often suspected when it does not actually exist.

In the absence of chemical tests, the difference in the water is judged of entirely by *taste* and *smell*, principally by the latter; and some conditions of the atmosphere being more favorable than others for the evolution and diffusion of the gas, the actual relative amount in evolution is often misjudged.

We occasionally hear old visitors to the springs express the opinion, that the water is not as strong as it was years before when they had visited it; and this opinion they entertain, not because of any difference in its operative effects, but because of its appearing less strong to the smell. Its sulphur flavor, they allege, is neither so strong about the grounds, or at the spring, as it formerly was. This is no doubt true in every condition of the atmosphere, and yet the water and its gas are essentially the same. Formerly, and until within the last few years, a portion of the grounds, for several rods below the spring, was a marsh of wet loam, covered with grass, into which the sulphur water flowed, and, saturating the earth, became decomposed with the vegetable matter, and consequently emitted a strong sulphurous odor, that could be detected in warm weather in any part of the grounds. Happily, these marshy grounds have all been carefully ditched and drained, and the water in its exit from the spring, being now confined to a narrow channel, rapidly flows away, thereby relieving from any sulphurous odor occasioned by its decomposition.

Liability to Error in Reference to Sulphur Waters.—While on this subject, it is not inopportune, I conceive, to allude to a popular and common error in reference to the *quality* of sulphur waters in general—an error into which the intelligent as

well as the ignorant are prone to fall,—I allude to the very common mistake of forming a judgment as to the strength and value of a sulphur water merely from its *taste* and *smell*. Most persons who have not carefully investigated the subject, are ready to believe that they have discovered a valuable sulphur fountain when they have found a water abounding strongly in sulphuretted gas. This, as a general thing, would be a mistake, and, as it is a mistake that might lead to a profitless use of such waters by invalids, it seems proper that attention should be distinctly called to it.

I have elsewhere* sufficiently contested the idea that sulphuretted hydrogen gas ought to be regarded as an efficient medicinal agent, except so far as its nervine and stimulant qualities give it such claims. I do not now propose to go over the arguments for the correctness of this opinion—they are sufficiently set forth in the chapter alluded to—but merely to enter up this *caveat* for the benefit of sulphur water drinkers,—that, *the mere fact of water being strongly impregnated with sulphuretted gas*, is not, *of itself*, a sufficient evidence that it is a valuable remedial agent.

We often see waters abounding in this gas, and, to the taste and smell, very much resembling the best

* Chapter on the "Relative Influence of the Gaseous and Solid Contents of the White Sulphur Water."

of our standard waters, and hence imagined by many to be identical in quality and equal in strength to them, but which, upon trial, are ascertained to have but little medicinal value, and are found, by analysis, essentially *without body*, with little efficiency in their medicinal salts; or, with a *combination of saline matters* not well adapted to give them medicinal virtue.

Neither does the color, nor abundance of deposits, made by such waters, as they flow from their source, do more than afford a problematical evidence of their value.

First. Because it is to the *quality* of the saline matters, rather than to their abundance, that we are to look for medicinal efficacy; and,

Second. Because the color of the natural deposits of all sulphur waters, unmixed with foreign bodies, as I have elsewhere said, is always essentially the same, being invariably white or opake-white; the various shades of blue, gray, red, black, etc., being occasioned by the influence of light and shade, or being chemical changes, occasioned by their coming in contact with foreign bodies.

The color of the deposits of such waters, it will be seen then, cannot to any degree indicate their quality or value. A large amount of deposit of saline matters, yielded by any mineral water, is strong *presumptive* evidence of its strength, but is not conclusive evidence of its medicinal value, in the absence of

a knowledge of the peculiar *quality* and *combination* of such saline matters. Hence we should not hastily judge of the value of a mineral water by the *color* of its deposits, nor even by the *large amount* of its deposits, but by their *quality*, and the proportions in which they are relatively combined in the water, forming a compound suited to the great mission of modifying and healing disease.

Springs are occasionally found that abound, either largely or sparsely, in sulphuretted gas, and that contain but little saline salts; and yet such springs are often valuable for particular forms or types of disease, and are rendered so from the quality and fortunate combination of their salts. On the other hand, waters may abound largely in saline matters, and some of them be valuable too, as single agents, yet the entire compound which they form may not be well adapted for sanatory and medicinal influences.

CHAPTER VII.

GENERAL DIRECTIONS FOR THE USE OF THE WHITE SULPHUR WATER.

Directions meant to be General, not Specific—Must not Generally look to the Sensible Operations of the Water for its best Effects—Moderate, or Small Quantities Generally Preferable—The best Times for taking it—Length of Time for which it should be Used—Necessary Preparations of the System for the Use of the Water—Sensible Medicinal Effects of the Water—Synopsis of Rules to be Observed—Use of Baths—Summary of the Medicinal Influences of the Water, and Rules necessary to be Observed in Using it.

MUCH, that might have been said under this head, has been anticipated in the chapter on "mineral waters in general."

It is scarcely necessary to remark, after all that has heretofore been said of the necessity of using MINERAL WATERS with *strict reference to the nature of the disease in which they are employed*, that it is not designed that the directions, herein given, shall be considered sufficient to guide in the use of the White Sulphur in all cases, or in any difficult and important case, to the exclusion of the more minute and specific directions which such case may demand.

It is my intention rather to indicate the *general rules*, which ordinarily must be observed in its administration, than to lay down definite directions which shall apply to all cases.

Every one who is familiar with the various types of disease, and with the peculiarities and radical difference in different constitutions and temperaments, modifying and influencing diseased action, will at once be satisfied of the impossibility of laying down any *absolute* rule, for the use of a potent mineral water, that should be strictly adhered to in all cases. Each case, to a certain extent, must, with this, as with all other medicinal agents, indicate the proper dose, and the proper manner of administration.

As has been already remarked, it is very common to attribute the beneficial effects of mineral waters to their immediate *sensible* and *obvious* effects upon the human body. I have shown this opinion to be erroneous—that, so far from it being true that such waters uniformly manifest their beneficial effects by their *active operations*, such operations frequently delay, or entirely prevent, the good which they otherwise would have accomplished through the medium of their *alterative* effects.

Those who desire to obtain the *alterative* operations of the water, must, as a *general rule*, take it in small quantities, and continue its use for such length of time as will be sufficient, in common spring parlance, to "saturate the system." Patients thus

using the water are apt, however, to become restless and dissatisfied for the first few days; so much so, that it is often difficult to reconcile them to this manner of administration; because, say they, "it is doing me no good;" they wish to see such tokens of activity as are given by prompt and vigorous purgation. In a general way, it is preferable that the water act sufficiently on the bowels, even when given in reference to its *alterative effects*, to obviate the necessity of giving any other medicine for that purpose; but it is often better to use some mild purgative from the shops, to effect this object for the first few days, than that the quantity of water should be greatly increased.

Comparatively, but few strangers, who visit the White Sulphur, are aware of the potency of its waters, and, under the false impression that no harm will arise from any quantity the stomach will bear, many are induced to use them in quantities that not only defeat their sanative effects, but do much positive injury.

I have just remarked that it is often difficult to reconcile patients to the use of small and inoperative quantities of this water. Many such instances come under my observation, and some in which painful experience alone could control. A prominent case of this kind occurred in my practice several years since, in the person of Mr. C. He was under

treatment for a complicated stomach and neuralgic affection, and had used the water twelve days, in small doses, with good effect; he was lodging at one of the adjoining hotels, and, believing that he was doing well, I did not see him for two or three days, and then casually met with him. I was astonished to find him greatly changed for the worse. His appetite, before good, had almost entirely ceased; his system was irritable and feverish; could not sleep at night; and in every respect was sensibly worse; had begun to despair, and proposed leaving for home, as he was "satisfied the water was not agreeing with him." I accused him of impropriety in diet, or of other imprudences, but he satisfied me that he had followed my directions in all such things, but that he had so far varied from my advice in the use of the water, as to take *sixteen* instead of *six* glasses daily, for the last few days. I advised this gentleman, as I would all others who have committed a similar "debauch" on cold water, to discontinue its use entirely for a time, and then return to the use of it in rational doses. This plan was pursued by him, and with the happiest results.

The opinion is as common as it is erroneous, among those who visit mineral waters, that they are to be benefited in proportion to the quantity they drink. Persons in health, or not debilitated by disease, do sometimes indulge in enormously large and long-continued potations of such waters, with apparent

impunity; but it by no means follows, that those whose stomachs are enervated by disease, and whose general health is much enfeebled, can indulge the habit with equal safety. In such stomachs, the effects of inordinate distention are always painful and injurious, while the sudden diminution of the temperature, from large quantities of cold fluid suddenly thrown into the system, can scarcely fail to prove injurious.

We sometimes meet with another class of visitors, who err just as much on the opposite extreme; they arrive at the springs, and place themselves under the government of a *recipe* for the use of the water, drawn up, most commonly, by some distant medical adviser, who has never himself had an opportunity of observing its effects; and such we not unfrequently see taking this *aqua medicinalis* in literally *broken doses;*—in quantities altogether insufficient to produce any sanative effect.

PERIODS FOR THE USE OF THE WATER, ETC.

The periods at which the water should be used, is a matter of importance. A common practice at the springs is to drink it a short time before each meal, morning, noon, and afternoon. In some cases, this manner of using it is to be preferred; in others, it is better that the whole that is taken in the course of the day be divided into *two parts*, and taken, either

in the morning before breakfast, and a short time before dinner; or, in the morning, and a short time before going to bed at night.

Advantage is very seldom secured from the water being taken before supper, and often it is prejudicial from its proneness to run off by the kidneys. Observation leads me to believe that, as a general rule, the water taken *before breakfast*, and before *going to bed at night*, is most serviceable to a majority of invalids; though there are some who cannot very well bear it at night, and attention should always be paid to this circumstance.

It should not be used immediately before or after a meal; nor should glass after glass ordinarily be taken in *rapid succession*. By this reprehensible practice the stomach is overtasked, and, immediately, unpleasant consequences result, such as *eructations*, *giddiness*, unpleasant *excitation*, and a painful sense of fullness, and sometimes a permanent injury of the stomach with *atonic dyspepsia*. Such a course also disposes the water to run off hastily by the kidneys—an operation for which it has naturally a strong tendency, and which often embarrasses in its administration.

LENGTH OF TIME TO USE THE WATER.

The length of time the invalid should continue the use of the water, depends entirely upon the *nature of*

the case,—the manner in which it has been used, and the *susceptibilities of the system*. Most erroneous notions exist, in a large portion of the public mind, upon this subject. Many believe that it will exert all its good influences, or, as they say, will "saturate the system," in eight or ten days; others allow it two, three, and four weeks, to effect the same object. Now, the truth is that the time in which the ultimate good effects of the water are accomplished, always depends, as before remarked, upon circumstances—*upon the nature of the case, the manner in which it has been used, and upon the susceptibilities of the system*. Some persons will be thrown as fully under its influence in two weeks as others will be in four; and yet it may be equally well adapted to each case. In every case of its administration, respect should rather be had to the *effects* it is producing than to the time it has been used. It never cures diseases until it has first produced certain *effects* upon the animal economy,—EFFECTS which can always be distinguished by the practiced observer during the progress of their operation, with the same certainty with which we can distinguish the effects under the alterative operation of mercury.

It often happens that persons, to whose cases the water is well adapted, use it assiduously for three or four weeks, without deriving a particle of permanent benefit; and all in consequence of so improperly

using it, both in time and quantity, as to force it out of the system by the emunctories, without "touching the case,"—without being permitted to tarry long enough to produce any of those *salutary effects* which must precede a cure.

It cannot, therefore, be too earnestly urged upon those who are using the water for any *obstinate disease* to have their attention fixed upon the *effects* which it is producing, or has produced, rather than upon a given number of days, in which they may have been taught to believe their systems would become changed or "saturated."

Dr. Armstrong found that from *six to twelve weeks* were often required for Harrowgate and Dinsdale waters to produce their full curative effects; and we occasionally see similar time required for the development of the full effects of this water. In some cases, however, where the system was previously well prepared, and the subsequent management judicious, the White Sulphur will produce its *alterative* operations in about two weeks. Such cases, however, are rare, *and it will generally be found that from three to six weeks*, or even longer, must elapse under its use, before those "*profound changes*" are wrought which precede and insure a return to health. These remarks, as far as they relate to *time*, are applicable to all our mineral waters that cure disease in virtue of their *alterative* action; for, if they be true as to

the *Harrowgate;** one of the strongest sulphur waters in the world, and of the *White Sulphur*,

* The *Harrowgate* and *White Sulphur waters* differ very materially. The author visited and spent some time at Harrowgate in 1851, and expresses the opinion, as the result of his personal observations and inquiries at the springs, that the Harrowgate Sulphur waters, while they are stronger than the White Sulphur in some of the *salts* common to both, are nevertheless inferior to the latter in *alterative* potency and efficacy.

There are no less than *fourteen* different wells at Harrowgate, all of which are more or less resorted to on account of their medical properties. Six of them are impregnated with sulphuretted hydrogen; five of them are pure chalybeates; one is a saline chalybeate; and two may be considered as simply saline, since they contain little iron and are destitute of sulphuretted hydrogen.

The *Old Sulphur well*, the strongest of this class of waters at Harrowgate, is beautifully transparent and sparkling; of the temperature of 49°, supposed to be the mean temperature of that part of Yorkshire. By analysis, it is found to contain in an imperial gallon—

Chloride of sodium	867·0	grains.
Chloride of calcium	87·0	"
Chloride of magnesium	42·5	"
Bi-carbonate of soda	20·0	"
	1016·5	
Sulp. hydrogen gas	15·64	cub. in.
Carbonic acid gas	2·72	"
Carburetted hydrogen gas	6·80	"
Azotic gas	8·84	"
	34·00	

scarcely, if at all, inferior in strength to that celebrated European spring, they cannot be less true of waters of the same class, but inferior in point of strength.

When sulphurous waters are prescribed, their operations should be narrowly watched, and if they produce untoward and unpleasant symptoms, such as *headache, gastric distress, furred tongue, quick and irritable pulse, with costive bowels and loss of appetite*, they should ordinarily be temporarily or permanently discontinued, as circumstances may demand. The temporary discontinuance of the water, under the circumstances just supposed, and the use of a brisk cathartic, or the lancet, if the state of the blood-vessels demand it, will generally enable us to return to its use in a day or two with safety and success.

PREPARATION FOR THE USE OF THE WATER.

Some preparation of the system, preceding the use of the water, is often, though not always, necessary for its safe and advantageous administration. Most persons, after the excitement usual to the travel in visiting the springs, will be profited by taking some gentle purgative, and by the use of a light and cooling diet for a day or two before the water is freely used. Those in feeble health should commence the

water with caution, and generally in its *least stimulating form*, that is, after it has remained in an open vessel until its gas has escaped. If, with these precautions, it fail to exert its desired effects, or produce unpleasant symptoms, the medical adviser, to whom it would be necessary to resort in such an emergency, would, of course, prescribe according to circumstances; nor can any general rule be given as respects the treatment that would be necessary in such a case,—one patient often requiring treatment essentially different from another.

Invalids, however, ought not to despair of the use of the water, and of its adaptation to their cases, simply because it may, at first, or even in the progress of its use, display some vagrant and improper action upon the system. *Errors in its action, if they may so be termed, generally arise from errors in its use*, and may generally be prevented by a change in the method of administration, or by some medical adjuvants, so that the water may be safely continued.

SENSIBLE EFFECTS OF THE WATER ON THE SYSTEM.

The sensible medicinal effects of the water are prominently displayed in its action upon the *bowels*, *liver*, *kidneys*, and *skin*, and, when drunk fresh at the fountain, by a lively *stimulant* effect upon the system in general, and upon the *brain* in particular.

Proper quantities, taken in the morning before breakfast, will often exert some *cathartic* effect in the course of the day. The *liver* is, in most instances, brought under its influence, from a few days perseverance in the use of it, as will be manifest from the character of the excretions. Its action upon the *kidneys* is readily induced, and we occasionally see it exerting, at the same time, both a diuretic and cathartic operation. Very commonly the exhalent vessels of the skin are stimulated to increased *perspiration;* but its full effects upon the surface, manifested not only by increased, but *sulphurous perspiration*, do not occur until it has been freely used for several weeks, nor until the secretory system generally has been brought under its influence.

As the system is brought under the influence of the water, the appetite and the ability to digest food are sensibly augmented. The spirits become buoyant and cheerful, with increased desire for social company and amusements.

Exercise, previously irksome, is now enjoyed without fatigue, and so great is the change in the whole man, that the patient often expresses his appreciation of it by declaring that he is "a new man,"—and so he is, in reference to his physical and social feelings.

EFFECTS ON THE PULSE.

The effect of the water upon the *pulse* ought to be distinctly noted, inasmuch as its action upon the circulatory system affords one of the best indications of its adaptation, or inadaptation, to the case.

As a general rule it will be found that, after the water has been properly used for a sufficient time to enter the circulation, by those to whose cases it is well adapted, and the frequency of whose pulse is much above the natural standard, the pulse will be reduced in frequency and in force. This reduction of the pulse is not the consequence of any *direct sedative* action of the water on the heart and arteries, but is the sanative result of its alterative and calming influences upon the general economy; and especially from its agency in stimulating glandular secretions, emulging the emunctories, removing offensive debris that oppress the circulatory organs and functions, thus giving a clear and unembarrassed course to the great circuit of the fluids through the system, as well the chyle and lymph as the venous and arterial blood.

A common consequence, from the proper administration of the water, in cases to which it is well suited, is an essential modification of the circulation both in frequency and force; so much so, indeed, that I am never surprised to find the pulse, whose

beat has been from 90 to 120 in the minute, reduced to 75 or 80, and, in many cases, quite down to the natural standard of the individual, whatever that may have been; while the volume of blood in the artery is increased, as well as the softness and mildness of its flow.

Experience has so clearly taught me to rely upon the reduction of the frequency and force of the pulse, as indicative of the value of the water to the patient, that I habitually look to such effects as among the most distinct indications to persevere in its use.

On the contrary, if the effects of the water be to increase the number of pulsations, or, in any considerable degree, to render the circulation more irritable, my inferences are unfavorable to its use; and if this state of things cannot be readily changed by a different administration of the water, its discontinuance is advised, for *it never proves beneficial when it perseveringly excites the frequency of the circulation.* There may be a condition of things in the case that would not justify a hasty discontinuance of the water, merely because of its proneness to stimulate, in a slight degree, the heart and arteries; but the propriety of continuing its use, in any such case, can only be safely judged of by the well informed and discriminating medical mind.

SYNOPSIS OF FACTS ILLUSTRATING THE MEDICINAL CHARACTER OF THE WATER, ETC.

The following facts, intended to illustrate the peculiar medicinal character and influences of the White Sulphur water, as well as the best manner of using it in ordinary cases, have been alluded to in other parts of this volume; nevertheless, (although it may involve a repetition,) it is thought best to group them under one general head, for the greater convenience of the reader.

Severally, and collectively, they are positions of great importance to the invalid, and long experience enables me to regard them in the light of APHORISMS, or fixed facts.

1. The water is always more *stimulant*, and generally *less purgative*, when taken fresh at the spring and abounding in its gas.

2. The *alterative*, or changing, effects of the water, are by far its most valuable effects, and are those, which, more than all others, give to it its distinctive and effective character.

3. If the water produces *active purgative*, or *diuretic* effects, its *alterative action* is correspondingly delayed.

4. In obstinate and important cases, the invalid should never consider that he has given the water a fair trial, or that he has obtained its full curative

effects, until he has experienced its general *alterative influences*, and maintained them upon the system for some time, and this entirely irrespective of the time he may have used the water.

5. As it is uniformly true that the water is seldom permanently serviceable, when it acts as an *irritant* upon any portion of the body, it follows that its use should not be persevered in when, for any considerable time, it continues thus to act. It may, however, almost invariably be made to act kindly and soothingly, by a modification of the manner of using it, or by such gentle medicinal appliances as the peculiarity of the case may demand.

6. From an improper use of the water, or from failure to use a timeous dose of medicine, to bring the system into a proper condition to receive it, it occasionally disagrees with persons (to whose constitution and case it is well adapted,) until the errors, whatever they may be, have been corrected.

7. An active and long-continued *diuretic effect* is generally useless, and frequently hurtful, and hence, when in much excess, should be arrested. This may be effected *with the utmost certainty* by a modification in the *quantity*, or *periods of using the water, and by gentle medical means that divert from the kidneys and determine to the liver and skin.*

8. As to the amount of water to be used in the course of the day, or as to the number of days it should be used; it is impossible to lay down a *defi-*

nite rule to apply in all cases. So much depends upon the nature of the case, and the peculiarities of the constitution of the patient, that no *fixed rule* in these particulars can be laid down as applicable to all cases, and an attempt to do so would be an act of empiricism more apt to mislead than to edify.

USE OF BATHS.

A most valuable aid in the use of this water is the *tepid*, *warm*, or *hot* sulphur bath. I cannot here enter into particular directions for the use of such baths. I just observe that they may be made an important auxiliary in a large circle of cases, if timely and otherwise properly employed.

Hot sulphur bathing, indeed *hot bathing* of any kind, is a remedy potent and positive in its influences;—capable of effecting much good when judiciously employed, or corresponding evil when improperly used. Like potent mineral waters, it is often used empirically and improperly, and, hence, becomes a curse when it should have been a blessing. It is a remedy essentially revolutionary in its character,—never negative, but always producing positive results upon the economy, for good or for evil.

The condition of the system indicates with sufficient clearness the time for commencing, and the temperature of the bath. In most cases, the *bathing point* is as clearly indicated under a course of sul-

phur waters as the blistering or bleeding point is in inflammations, and the value of the remedy is much dependent upon such timely employment. When the water has well opened the bowels,—has found its way into the general circulation, softening the skin and calming the irritation of the arterial system, the *sulphur baths* may be used with great confidence in their efficacy.

Hot baths should never be taken during the existence of febrile excitement. They should be used on an empty stomach, and, as a general rule, before the decline of the day, and their temperature always carefully regulated to suit the nature of the case and the state of the system.

CHAPTER VIII.

DISEASES IN WHICH THE WHITE SULPHUR MAY, OR MAY NOT, BE USEFULLY PRESCRIBED.

Dyspepsia—Gastralgia—Water-Brash—Chronic Gastro-Enteritis—Diseases of the Liver—Jaundice—Enlargement of the Spleen—Chronic Irritation of the Bowels—Costiveness—Piles—Diseases of the Urinary Organs—Chronic Inflammation of the Kidneys—Diabetes—*Female Diseases:* Amenorrhœa, Dismenorrhœa, Chlorosis, Leucorrhœa—Chronic Affections of the Brain—Nervous Diseases—Paralysis—Some forms of Chronic Diseases of the Chest, or Breast Complaints, (to be avoided in Pulmonary Consumption)—Bronchitis—Chronic Diseases of the Skin, Psoariasis, Lepra, Ill-conditioned Ulcers—Rheumatism and Gout—Dropsies—Scrofula—Mercurial Diseases—Erysipelas—Not to be used in Diseases of the Heart, or in Schirrus and Cancer—*Chalybeate Spring*, etc.

ALL mineral waters, as before remarked, are stimulants to a greater or less degree, and consequently are inapplicable to the treatment of acute, or highly inflammatory diseases. This remark is especially true as relates to the White Sulphur, particularly when drunk fresh at the spring, and abounding in its stimulating gas. It is true, as before shown, that when its exciting gas has flown

off, it becomes far less stimulating, and may be used with safety and success in cases to which, in its perfectly fresh state, it would be totally unadapted. But even in its least stimulating form, it is inadmissible for excited or febrile conditions of the system; and especially to cases of inflammatory action—at least, until the violence of such action has been subdued by other and appropriate agents.

Various diseases of the stomach, liver, spleen, kidneys, and bladder, as well as some derangements of the brain and nervous system generally, are treated successfully by this agent. To the various affections of the skin, unattended with active inflammation; to chronic affections of the bowels, and to gout and rheumatism, it is well adapted. In hæmorrhoids; in some of the chronic affections of the womb; in chlorosis and other kindred female disorders; in mercurial *sequelæ*, and especially in the secondary forms of *lues*, and ill-conditioned ulcers in depraved constitutions, it constitutes the most valuable remedy to which the invalid can resort.

If the individual, about to submit himself to the use of this water, is suffering from fullness and tension about the head, or pain with a sense of tightness in the chest or side, he should obtain relief from these symptoms before entering upon its use. If his tongue be white or heavily coated, or if he be continuously or periodically feverish, or have that peculiar lassitude, with gastric distress, manifesting recent

or acute biliary accumulations, he should avoid its use until, by proper medical treatment, his biliary organs are emulged, and his system prepared for its reception. Much suffering, on the one hand, would be avoided, and a far larger amount of good, on the other, would be achieved, if visitors were perfectly aware of, and carefully mindful of these facts.

It is an every-day occurrence during the watering season at the "White," for persons to seek medical advice, for the first time, after they have been using the water for days, perhaps for weeks, and it is then sought because of vagrant operations, or injurious effects of the water. In most such cases there will be found, upon examination, either the existence of some of the symptoms just mentioned, or evidences of *local inflammation* in some part of the body, sufficient to prevent the constitutional efficacy of the remedy. I am often struck with the control which an apparently inconsiderable local inflammation will exert, in preventing the constitutional effects of mineral waters. To remove such local determinations where they exist, or greatly to lessen their activity, is all-important to secure the constitutional effects of sulphur water.

It is necessary to reflect that mineral waters, like all medicinal substances, are adapted only to certain diseases, and that the more powerfully they act, the greater mischief they are capable of doing if improperly administered; for, if it be asserted that they

are capable of doing good only, without the power of doing harm, we may be satisfied that their qualities are too insignificant to merit notice.

This consideration indicates the necessity of some caution in the use of waters which possess any sanative powers, and suggests the propriety in all doubtful cases, of consulting some professional man familiar with the subject, whose judgment may determine how far the water is applicable to each individual case, and in what manner it should be employed to be most efficacious.

A long list of successful cases that have fallen under my care, adapted to illustrate the beneficial effects of these waters, in some of the more general and important maladies, might perhaps, without impropriety, be inserted here; but I am induced to omit the insertion, because I am aware with what suspicion medical cases, however well authenticated, are received from an individual, when they are given to favor any particular practice, or to recommend any particular water. Besides, the insertion of names is objectionable in all private practice, and I consider the reputation of the waters to be now too well established to require such assistance.

But, anxious to obviate all possibility of mistake, and to prevent the reputation of a remedy so well deserving public confidence from being sullied by failures, on account of misapplication and improper collateral treatment, I shall add to a catalogue of the

leading diseases, to which these mineral springs are more immediately adapted, a few succinct directions for the rational observance of such cautions as will be most likely to increase their salutary efficacy. And this, from local situation and the ample experience of more than twenty years, I flatter myself I am in some measure capable of doing.

DYSPEPSIA.

In this common and annoying disease, consisting in derangement of function in the organs of digestion, the White Sulphur water has long maintained a high character. In this affection, especially in its confirmed stage, we almost invariably find the biliary secretions either vitiated in quality or deficient in quantity; constituting an important, and, not unfrequently, an embarrassing, feature in its treatment; nor can we ordinarily succeed in effecting a cure until the secretory functions of the liver are restored to a natural and healthy condition.

The beneficial effects of the water in *dyspepsia*, seem to result mainly from its sanative action upon the liver. To *alterate* the secretory functions of that organ, and establish a flow of healthy bile, is one of the great fortes of the water, and almost an invariable result of its persevering use.

That the water benefits the stomach, in many cases, by a primary action,—first, as an alkali and stimu-

lant, neutralizing its acidity, and imparting directly a tone and energy to the *viscus*—and, secondly, by a positive influence on its glandular structure, occasioning a healthy flow of gastric juice, I do not doubt. Still, the most decided and permanent benefits derived by dyspeptics have always seemed to me to be the result of *full alterative impressions upon the liver.* Certain it is, that without such an influence upon that organ, *the dyspeptic can never be confident of the permanency of his relief.* It would be well for sufferers under this distressing malady to bear this in mind, and not abandon the use of the water, as many do, until it has fully impressed the liver; nor be discouraged at its apparent want of efficacy, until it has been used sufficiently long to effect this object.

In the course of my observations, I have often alluded to the *alterative effects* of sulphur water on the liver, as affording a most important indication of its efficacy. It may be asked, how shall it be known when this alterative effect has taken place? I reply, you are to judge of this mainly by the character of the excretions, and by all the indications by which you judge of the alterative effects of mercury upon the same organ.

Dyspeptics often grievously err in the use of the water, by mistaking its primary effects, which are generally transitory, for a permanent cure; and hence abandon it before its *permanent sanative* action

has been obtained. Such patients not unfrequently, after taking the water for a week or ten days, find that the acidity of the stomach has been relieved, their appetite increased, and that they are able to "eat everything before them." This is all very well, as far as it goes, and if their attack be recent and slight, this comfortable state of things may continue; but it will much oftener turn out to be merely the alkaline and stimulant influence of the water upon the coats of the stomach, imparting this generous tone to the *viscus* for a season, and which in all probability is destined to lure them into an excess of diet and other imprudences, which will, ere long, develop to them the fact, that the monster was "scotched, not killed."

The importance of the subject urges me to repeat, that the *confirmed dyspeptic* cannot too forcibly impress upon his mind the essential practical truth, that the *alterative* influences of the water must be exerted upon his system, before he can have assurance of permanent good from its use.

As costiveness and irregularity of bowels are generally found in dyspepsia, some of the warm laxatives may be occasionally used for a short time after commencing the use of the water. And, as the disease is seldom unaccompanied by chronic obstructions, or, at least, a torpid secretion of the liver, it will generally be found advisable to combine a slight mercurial with the medicine, intended to act slowly on the

bowels, and, for this purpose, pills, composed of aloes, or ex. colocynth and blue mass, taken in such doses as to keep up a regular peristaltic motion in the bowels, will be found to answer very well. At the same time, it will be found advantageous to use some of the bitter vegetable tonics a short time before each meal.

The water, as a general rule in dyspepsia, should be taken in *moderate* or small quantities, and with less or more of its gaseous contents, agreeably to the excitability of the system, and the amount of excitation which it may be desirable to produce. From *four* to *eight* glasses in the course of the day is the quantity that is generally found most serviceable in dyspeptic cases.

Where the nervous system bears the fresh water with impunity, I prefer that the dyspeptic take it soon after it has been removed from the spring. With many, however, there is found too much excitability for the water perfectly fresh; such, therefore, should use it more or less stale, as their system will bear it.

GASTRALGIA, *or Nervous Dyspepsia*, is a form of disease occasionally met with at our watering places, and is an affection often of difficult and uncertain management, whatever be the remedies employed. When it is purely functional and disconnected with organic lesion, the White Sulphur, administered in

moderate quantities, and in its least stimulating form, is a safe, and sometimes an efficacious remedy. I usually prefer, however, to continue its use, at first, no longer than may be necessary to bring the bowels and the secretory action of the liver under its influence, and then give the patient the advantage of the tonic influence of the waters of the *Sweet*, or *Red* and *Sweet*, and their *champaigne* baths. Advantage is often derived by alternating during the season between the latter springs and the White, or some other sulphur water.

Pyrosis, *or Water-Brash*, is another form of stomach disease, in which this water is occasionally used, and sometimes with very good effects. Indeed, it is rarely used in water-brash without benefit. In this form of disease, the water should never be taken in large and often-repeated draughts: from such a course increased debility of the stomach, with other deleterious consequences, would rarely fail to follow.

When good reasons exist for supposing the stomach to be *schirrous* or *cancerous*, the patient should carefully abstain from the use of this, or any of our mineral waters. Several cases have come under my notice, in which much injury was received from their use, some from the Alum water, others from this.

It is scarcely necessary to say to the intelligent reader, that dyspepsia is rarely cured, whatever be the remedies used, without a careful attention to *diet*.

By care in diet, we by no means wish to be understood, that the patient is to confine himself to the *stereotyped recipe* of "black tea and toast," and other light slops—the tendency of which is rather to enervate than invigorate the stomach—or that, in his mind's eye, he is ever to be weighing or measuring the quantity of food he is to consume at each meal. It has rarely been my good fortune to see any one cured of confirmed dyspepsia, who had been long kept on the miserably attenuated, debilitating slops, so often recommended for such; and especially one, who weighs, if not his appetite, at least his aptitude to eat by *avoirdupois*. The fastidious particularity, *secundum artem*, in such cases, that is often witnessed, serves admirably to impress upon a mind, disposed, from the nature of the case, to be distempered, the appalling truth that mortal disease is ever threatening; to induce low spirits and despondency, and to superadd new horrors to a disease of itself sufficiently horrible.

The diet in dyspepsia should always be appropriate to the wants and ability of the stomach. In a majority of cases, the dyspeptic will more readily digest the lighter meats than the vegetable matter, upon which they generally feed; and in such cases there is nothing more proper than light meats. Fresh eggs, properly prepared, may always be taken. Coarse rye bread is often the best diet of the kind. When wheat bread is used, it should always be well light-

ened and stale. Bread of corn, popular as a diet in Virginia, is found to agree admirably with some dyspeptics. Milk, as a general rule, is not only harmless, but useful. Vegetables, whether dressed or undressed, in their simple state, or manufactured into pies, tarts, sweet-meats, etc., etc., must be repudiated. The same of soups, gravies, molten butter, etc. After all, however, there is no one who can judge of diet for the dyspeptic like the dyspeptic himself. Let such carefully examine themselves, and especially the effects of different articles of diet upon their system, and they may, without mistake, settle down upon those that are most beneficial. The true and only secret upon this subject is, to *eat nothing that disagrees, and anything that does not.*

CHRONIC GASTRO-ENTERITIS, OR IRRITATION OF THE MUCOUS MEMBRANE OF THE STOMACH AND BOWELS.

Perhaps the largest class of invalids, that visit our mineral waters, are those suffering from various depravities of the digestive and assimilative functions, and with deranged condition of the mucous surfaces, particularly of the stomach and bowels. Of all people on the globe, the white population of the United States are most subject to this class of affections. The abundance and variety of the food in which they indiscriminately indulge; the use of bad

liquors and wines, drugged, as they often are, by the most poisonous substances, by which a gill of pure spirits is represented in a quart of the tempting compound; together with fast eating, or rather bolting of food, peculiar to the "*go-a-headi-tiveness*" of American progress; the consumption of gross and improper food; the chewing and smoking of tobacco, not to allude to the immense use of strong coffee;—to which may be added the incessant strain of the brain, and a never-ceasing excitement in the eager and uneasy struggle for wealth or political promotion; if to these we add the effects of a constantly-acting malarious influence in many of the new States and Territories, and a variable and irregular climate in other portions of our country, we will be at little loss to account for the common occurrence of the congestions and irritations of the digestive mucous surfaces, which are exhibited under such a variety of symptoms as often to conceal their true pathology from the careless observer, and even, not unfrequently, to assume the name of different diseases, well calculated to mislead as to their true nature.

Under the influences which this congested, irritated, and sometimes inflamed, condition of the mucous membrane of the stomach and bowels gives rise, the portal circulation is retarded, and the liver secretes slowly and imperfectly; with bad digestion, there must be imperfect chylification, and imperfect and unhealthy blood. The functions of the kidneys, too,

will be badly performed, and, according to the diathesis that prevails, the urine will show an acid or alkaline predominance, in the form of lithic acid or the phosphates of lime and magnesia; irregularity of the bowels will prevail, sometimes too loose, sometimes costive; occasionally cholic will afflict, but more frequently *gastric* or *intestinal* neuralgia, manifested by vagrant and unsettled pains in various parts of the abdomen and chest, not unfrequently extending to the windpipe, similating genuine bronchitis, and often to the region of the heart, giving uneasy and alarming palpitations of that organ.

When these intestinal mucous derangements exist in the female, the uterine system is often deranged, the periods become irregular or suspended, and the natural secretions deficient; while *leucorrhœa*, or *chlorosis*, adds new causes of debility and discouragement. The *brain*, badly nourished by thinned or vitiated blood, is brought, through its nerve conductors, into a reverse sympathy with the diseased surfaces of the stomach and bowels, and fully acts its morbid part in the drama of discomforts and complainings, in the form of distressed forebodings and imaginings, with manifestations of such wretchedness and unsteadiness of purpose as we witness in *hypochondriasis* and *hysteria;* sometimes by vertigo, headache, languor, disinclination for business or society, ringing in the ears, watchfulness, and, gene-

rally, by depressed or low spirits, with irritability and want of equanimity of temper.

This peculiar disease of the stomach and bowels is far more common than it was in by-gone years. I am satisfied that the appearance of such cases at our fashionable watering places has been more than duplicated within the last ten years. It occurs more frequently with gentlemen than with ladies, agreeably to my observation, and more frequently in youth and middle age than in persons advanced in life, but occasionally in all ages, and in both sexes. In several cases that have been under my observation in the last year or two, I have been able to trace the origin of the disease very distinctly to the use of bad wines and spirits, and to the intemperate use of tobacco.

In the progress of this disease the *neuralgic symptoms* often become very prominent, so much so indeed, as sometimes to mislead the unwary physician, as they often do the patient, into the belief that the derangement of the nerves is the primary and principal disease.

It is easy for the experienced practitioner to understand, but it is difficult for him to describe, the multifarious and anomalous symptoms, or sympathies, consequent upon a confirmed irritation of the mucous coats of the stomach and bowels, that give rise to gastric or intestinal neuralgia. The great mobility of the nerves, and of the nervous centre, the brain,

gives rise to symptoms which, to some extent, actually control the case and the patient completely, and appear so prominent as to challenge a principal attention, while in fact they are mere *sympathies* of a morbid derangement, which lies entirely back of their development, and half hidden from view by their distressing prominence. To direct an exclusive nervine treatment for the relief of such symptoms, to the neglect of the pathological condition of the mucous surface upon which they depend, would be a great mistake; such treatment, at most, could only be *palliative*, and no more effective than an attempt to destroy a tree by merely lopping off its branches.

In sulphur waters, we possess a valuable remedy for the treatment of the disease under consideration, while in the various neighboring aluminous and chalybeate springs, we have agents well adapted to impart tone and strength to the nerves, after the system shall have been prepared, by the use of the sulphur water, for their employment.

The selection of the time for the interposition of the strictly tonic waters, in such cases, is a matter of no little importance to the invalid; for when they are used before proper alterative changes have been effected in the circulation, and upon the diseased surfaces and tissues, they will always prove inefficacious, and sometimes prejudicial.

DISEASES OF THE LIVER.

The liver is the largest gland in the human body and the first to exhibit development in the fœtal state. It exists in almost every variety of animals, even in those whose other organs are very imperfectly developed. Its great size, its early and relative development in the *fœtus*, and the complicated character of its vascular machinery, all point it out as an organ of immense importance in the animal economy, and render the opinion very probable, which has been long entertained by physiologists, that it performs other functions and offices in the body, besides the daily secretion of a small quantity of bile.

The amount of bile secreted by the liver in twenty-four hours, in an ordinary healthy condition of the body, is said not to exceed six or eight ounces—a relative amount altogether inadequate to its vast size and vascularity, in contrast with any other gland of the body. It serves as a central termination of the black blood of the abdomen, as the lungs do of the blood of the general system—a peculiarity which distinguishes it from every other gland of the body, and renders it probable that, like the lungs, it exerts a peculiar influence upon the circulating fluid.

The variety of forms and phases under which liver complaints exist, and the sympathies by which the

liver is connected with other organs and tissues of the body, demand the careful consideration of the medical practitioner in making up his diagnosis, and must always be duly weighed in forming his prognosis as to the results of clinical effort.

The sympathy between the liver and stomach is constantly remarked, and is often so intense as to cause the practitioner to doubt as to which of the organs is the primary seat of disease. Indeed, the symptoms attending biliary derangements are so easily mistaken for, and so generally accompanied by derangements of the other digestive organs, as often to mislead both the patient and his medical adviser. Hence it is, that liver disease and dyspepsia are so often confounded, and the intelligent physician unable clearly to determine which of these organs was the original seat of the malady.

The sympathy between the liver and brain has long been observed. In functional or structural derangements of the liver, there are few symptoms more constantly present than vertigo, headache, or disturbance of the mental faculties. So constantly do these disturbances of the mental functions exist in liver complaints, that they present one of the leading diagnostic symptoms of the existence of the disease. It has long been observed that intense thought, or any strong emotion of the mind, will derange the biliary secretions. Fear, grief, and the

other depressing passions, lessen; while anger, hope, joy, etc., increase and sustain a rapid flow of bile.

Diseases of the liver not uncommonly assume the appearance of *pulmonic affections*, and sometimes end in actual disease of the lungs. Doubtless this is often owing to the encroachment of the liver on the lungs, when the former is morbidly enlarged—thus disturbing the respiratory functions; or an irritation may extend itself from the former to the latter, and assume all the symptoms of an original idiopathic affection, while the original malady lies concealed.

CHRONIC HEPATITIS is a very common disease in this country, especially in our warmer latitudes and miasmatic districts. In its least complicated form, it is characterized pathologically by a plethora or congested state of the vascular system of the liver, accompanied, of course, by derangements of the biliary functions and of the nervous system of the organ. Its approaches are generally slow and insidious, and often the health is entirely undermined before the sufferer is fully aware of his danger. For, without any symptoms of severe indisposition, it will often run on to suppuration, or organic induration of the viscus, before its existence is suspected.

I once saw a patient (a young man) whose first serious concern for his condition was occasioned by the bursting of an abscess in his liver. He died a

few hours afterwards, and a post-mortem examination revealed the fact that his liver had been so entirely absorbed as to leave only a very small portion investing the gall-bladder.

Chronic inflammation of the liver seldom goes for a great while without producing important mischief in the organs, occasionally resulting in abscess or tubercles, but more generally in indurating the structure, or enlarging the volume, of the viscus, constituting what is termed "*enlarged liver*," schirrous liver, etc.

While this chronic inflammation, obstruction, or impaired function of the liver is going on, they occasion indigestion, flatulence, a tenderness or pain in the right hypochondrium, which pain is often extended to the right scapula or top of the shoulder, but occasionally in the back, or on the left side over the region of the heart. (*Johnson.*) To these symptoms are usually added an unpleasant sense of distension about the stomach, acidity, inability to lie comfortably on the left side, with pale or sallow complexion, and a gradual diminution of the flesh and strength.

In the beginning of these affections, the bowels are generally constipated, the fæces being at one time of a dark and at another of a lighter color than natural. As the disease advances, it sometimes ends in diarrhœa or dysenteric irritation.

Listlessness, languor, and aversion to enterprise,

are characteristics of the disease. The sufferer delights to detail the misery of his case, and contemplates it ordinarily in its most unfavorable results. Wherever we find derangements of the hepatic functions, we find low spirits, irritability of temper, fickleness, timidity and hypochondriacism, to a greater or less extent, and this, irrespective of the high natural order or cultivation of the mind of the sufferer.

The White Sulphur water acts specifically upon the secretory organs, and especially upon the liver.

We have already, in another part of this volume, shown the striking similarity of action between mercury and sulphur waters upon the animal economy. In nothing is this more manifest than in their operations on the liver.

The *modus operandi* of sulphur water upon this viscus is dissimilar to that of mercury, and yet the effects of the two agents are strikingly analogous. The potent and controlling influences of the water over the secretory functions of the liver, must be regarded as a specific quality of the agent, and as constituting an important therapeutical feature in the value of the article, for diseases of this organ. Its influence upon this gland is gradually, but surely, to unload it, when engorged, and to stimulate it to a healthy exercise of its functions, when torpid. The control which it may be made to exercise over the liver, in correcting and restoring its energies, is often as astonishing as it is gratify-

ing—establishing a copious flow of healthy bile, and a consequent activity of the bowels—imparting vigor to the whole digestive and assimilative functions, and, consequently, energy and strength to the body, and life and elasticity to the spirits.

Attention was directed, at an early period in the history of mineral waters, to their controlling influence over diseases of the liver, and by the best informed practitioners both of Europe and this country, sulphur waters have always been favorite remedies in the treatment of that class of affections.

The celebrated Dr. Armstrong, although of cool, discriminating, and well balanced mind, was so much devoted to their use in chronic inflammations and congestions of the liver, that some of his contemporaries, less practiced in their use, thought him infatuated upon the subject. He preferred them, most decidedly, as an independent remedy, to mercury in all its forms; but very properly observes, that in some cases it will be found best to combine the operation of the two agents at the same time.

For many years I have kept a *case book* at the White Sulphur, and have carefully noted the influence of the water upon such diseases as have been submitted to my management. Among the number are several hundred cases of chronic affections of the liver, embracing disease of *simple excitement*, chronic *inflammation*, *congestion*, *engorgement*, and *obstruction* of the biliary ducts, etc. etc. These cases were

all treated either with the White Sulphur water, alone, or aided by some other appropriate alterative remedy; and in looking at the results, I must be permitted to express a doubt whether a larger *relative amount* of amendments and cures have ever been effected by the usual resources of the medical shop. This I know is high eulogy of sulphur water in such diseases. It is considerately made, and is not higher than its merits justify.

It is proper that those affected with liver disease, (and they constitute no small portion of the population, in certain districts of our southwestern territory,) should know something of the confidence they may place in these waters for relief.

Volumes might be filled with details of gratifying results that have taken place in the cases of invalids, from almost every section of the country, who visited these waters as a sort of "last resort" for liver disease. And hundreds of delighted witnesses may be found, especially in the warmer regions of the south, who bear a willing and grateful testimony to their utility in such cases.

Let me not be understood, however, as advancing the opinion, that sulphur water will cure every case of chronic liver disease. Far from it. I have already stated elsewhere, that mineral waters will sometimes fail in chronic diseases of *disordered action only*. This, it is most probable, happens in cases where the blood-vessels have been so long distended

as to have lost their power of returning to their natural state. Besides, it will happen, that among the number of invalids that crowd our watering places, seeking relief from this common affection, many will be found in whose livers organic lesions have already taken place. In such, perfect cures need not be expected, either by sulphur waters or any other agents.

In another part of this volume,* the importance of using mild alterative cathartic medicines, in connection with mineral waters, has been distinctly stated. In no class of cases is this practice more important than in diseases of the liver. In obstinate cases, or those in which the use of mercurials are inadmissible, the *nitro-muriatic bath* may be resorted to with good effect as an adjuvant to the water.

JAUNDICE.

Jaundice is a form of liver disease in which the White Sulphur water is used with very happy effects.

This affection is characterized by a yellow tinge of the skin generally, and particularly of the *tunica conjunctiva;* deep yellow or brown color of the urine, pale or clay-like color of the stools, sense of languor and lassitude, with depression of spirits and a disinclination to exercise. A sense of weight or uneasi-

* See chapter iii. "On the Use of Medicines, etc."

ness is often felt about the pit of the stomach, while the bowels are costive and the urine very highly colored.

The cause of this disease has always been considered to be obstructions of some kind or other to the free egress of the bile from the excretory ducts of the liver. Most commonly, these obstructions are occasioned by inspissated bile or calculous concretions within the gall ducts themselves; occasionally by spasmodic constrictions of the *biliary* tubes; and now and then from external pressure by tumors on the liver itself, or some neighboring part.

When the obstruction arises from inspissated bile or very small *calculi*, or from spasm of the gall *ducts* themselves, the disease is comparatively easily relieved; and such cases are generally cured by the White Sulphur water with certainty, in a few weeks.

When, however, the obstructing *calculi* are large, and the spasm and irritation considerable, the disease is not only more tedious, but the measure of relief from the water more uncertain.

The use of mercurial aperients, especially small doses of calomel with aloes, or col. and ant., which, while they clear the bowels, excite the biliary ducts, are generally valuable adjuvants to the water. Advantage is also derived, especially in the declining stage of the disease, from the bitter vegetable infusions, such as camomile, gentian, or quassia. The *nitro-muriatic* bath is a remedy of much promise in

this disease, and should not be overlooked in obstinate cases.

Mr. G., aged forty-five, of robust frame and naturally of good constitution, sought my advice on the 6th of September, 1856. He was suffering from intense jaundice of several weeks' continuance; his entire surface was of deep orange hue; constant sense of uneasiness in his right side; bowels obstinate; excretions dry, and whitish in color; tongue covered with a yellowish fur, and spirits desponding.

Mr. G. has lived for several years in a miasmatic district, and for two consecutive years has had intermittent fever. He had been using the water *very freely* for two weeks before he called at my office, but without any appreciable benefit; during all this time the water had been running off by the kidneys, but had not affected his bowels, softened his skin, or in any degree alterated his liver. I advised mercurial medicines, which it became necessary to repeat for several consecutive nights; had warm cataplasms applied through the night to the hypochondriac region, first having the part well rubbed with a stimulating lotion; diluted nitro-muriatic acid was also freely used subsequently, over the region of the liver. Caused him to *discontinue the water entirely for twenty-four hours*, and then resume it morning and night in smaller doses than he had been using, and with longer intervals between the glasses;—the warm sulphur bath was used, but not until the water, with

the mercurials, had begun to impress the liver. In six days after Mr. G. entered upon this treatment, he was decidedly improved, and, in less than three weeks, his amendment was so great, and the prospect of its continuing so evident, that he was advised to leave the Springs for his home.

I give this case not because there is anything peculiar in it, but as a sample of many that occur, and especially to show the beneficial effects of medicines in connection with the water in such cases, and without which, in the case related, it is obvious that the water would have been very tardy in producing a cure, if indeed it had not entirely failed to do so.

CHRONIC ENLARGEMENT OF THE SPLEEN.

Disorder and enlargement of the spleen are very often met with at all our watering places. For many years I have carefully noted the operation of the White Sulphur water in such cases. Unaided by other means, it has not realized the high hopes I once had of it. Satisfied of the great advantage—I might say absolute necessity in many cases—of urging a treatment more active than the water alone, I now rarely rely on it to the exclusion of other agents.

The preparations of iodine, used both internally and externally, are valuable adjuncts to the water in these cases. In some cases, good effects are derived

from large doses of quinine; and I often find it necessary to aid the purgative operation of the water by the use of mild cathartics.

CHRONIC DIARRHŒA.

Observation of the benefits derived from the use of the White Sulphur water in chronic irritations of the bowels, is coeval with the early use of the water; yet in no other diseases is there greater necessity for a careful pathology, and a prudent and skillful use of the remedy. As a kind Providence "tempers the wind to the shorn lamb," so must this agent, potent for good or ill in such cases, be tempered to the morbid irritabilities of the bowels.

In such affections, attended with frequent and copious serous dejections, the water, if admissible at all, should be used with care, and in small portions at a time. Where there is extreme susceptibility of the canal, with tenderness on pressure, the draughts of water should be very small, not exceeding half a glass, (about one gill,) taken at such intervals as to secure the bowels against any excitation from the remedy. Under this guarded and almost homœopathic administration,—and if necessary, connected with an occasional soothing potion, warm external applications to the bowels, and the frequent use of a tepid sulphur bath,—I often witness very gratifying results.

Somewhat less difficulty is presented in *mucous diarrhœa*, and in such cases the action of the water, prudently used, is generally favorable. We sometimes find an affection of the mucous coat of the bowels, especially in persons from the warmer regions of our country, connected with functional derangements of the stomach and liver; in such cases, it will usually be found that, in proportion as the tone of the former, and the healthful secretions of the latter, are restored, the morbid condition of the bowels ceases. In no class of cases, however, if we except diseases of the lungs, is more prudence demanded in the administration of the water than in irritated conditions of the bowels. When judiciously and cautiously prescribed, the agent is not only a safe, but a valuable remedy, in diseases of this class; but when used, as it sometimes most imprudently is, in cases attended with excessive irritation or ulceration of the coats of the bowels, most prejudicial consequences may result.

In connection with the water, in this class of diseases, I often, and with excellent effect, use warm emollient cataplasms, with the internal administration of some mild alterative and soothing medicine.

To warm *sulphur baths*, in such cases, much confidence is due. To be safely and successfully employed, the bath should be carefully adapted, both as to *time* and *temperature*, to the demands of the case.

Mr. J., of Virginia, aged seventy-six, naturally of

good constitution, arrived at the Springs in August, 1856; he had been suffering with *chronic diarrhœa* of muco-serous character for two years, attended with an almost entire absence of bile in the excretions. The disease had reduced him considerably both in flesh and strength; his operations, which were large and frequent, were so prostrating as often to oblige him to use diffusible stimulants to maintain his strength.

On reaching the Springs, Mr. J. commenced the use of the water in the dose of half a glass at a draught, and used it, at first, only before breakfast and after tea. For the first two or three days he used but one pint in the twenty-four hours, which was gradually increased to two, and finally to three pints in the course of the day. An obvious amendment was perceived after the sixth day, and in three weeks Mr. J. was permitted to leave the Springs, apparently, and, as observation has since verified, permanently, cured.

The sulphur bath was used in this case, with some local applications to the bowels at night, and now and then a soothing pill or potion given, mainly with the view to have the water well retained in the system. The treatment, except by the sulphur water and baths, could not to any considerable degree account for his recovery.

I have given this case because it is a recent one, and remarkable on account of the age of the patient,

the long continuance of the disease, and the rapidity of the cure. Cases not dissimilar, except in the age of the patient, have been frequent in my practice at the springs for the last twenty years.

The following case is published with the view of presenting the effects of the water in diarrhœa connected with *subacute inflammation* of the coats of the stomach and bowels.

Mr. G., of North Carolina, consulted me in August, 1856; his disease was subacute inflammation of the stomach and bowels, attended with frequent debilitating operations. The case was of several months' continuance, and had supervened upon an imperfectly cured dysentery; his tongue was thin, hard, and glazed; pulse feeble, but quick, and varying from 100 to 120 at different periods of the day; the muscles covering his bowels were tense and firm, and there was some tenderness on pressure over the whole surface of the abdomen. He was considerably reduced in flesh; his appetite precarious and bad, and his spirits worse.

Mr. G. had been using the water, and in quite too large doses, for several days before he called upon me, which had, to some extent, aggravated all his symptoms. Under its use he had become feverish, his appetite diminished, his strength decreased, and his bowels more irritable. I caused him to *discontinue the water* for several days; had warm poultices applied to his bowels; administered morphia, ipe-

cacuanha, and mild mercurials. In three days the febrile tendency had so abated as to induce me to try the water in its *stale form*, and in doses of half a glass, repeated at intervals of one hour. It acted most kindly and soothingly, and his amendment speedily became obvious; indeed, he experienced great relief from all his worst symptoms; his bowels, however, still continued to be too often moved, which I judged to be rather the effect of debility of the alimentary canal than of any irritating cause. Under this state of things, believing the irritation and congestion of the vessels sufficiently subdued to enable him to take tonic waters to advantage, I ordered him to the Rockbridge Alum, and have since learned that he became entirely well before returning home.

COSTIVENESS.

In costiveness, dependent upon deficient or depraved biliary secretions, great confidence may be placed in the persevering use of the water, especially if it be aided by the occasional administration of small mercurials combined with taraxicum and rhubarb.

Where great poverty or deficiency of bile exists, the *inspissated ox gall* is found to be useful. It may be taken in pills, in quantities of ten or fifteen grains daily, with a little taraxicum and rhubarb.

In costiveness from general *inertia* of the alimentary canal, there is less cause to be pleased with the efficiency of the White Sulphur water. Such cases are commonly found connected with great languor of the body and general nervous irritability. The use of the *sulphur baths*, of a temperature from 98° to 106° should be employed in such cases, in connection with the water, which should be drunk as freely as the stomach will bear it, morning, noon, and night, unless it run off by the kidneys; in which case it ought to be entirely suspended for a day, and an active cathartic taken before its use is resumed.

PILES.

The use of mild laxatives in hæmorrhoids has been so long a favorite practice, that nothing needs be said here in its favor. The beneficial effects of this water in piles, are, doubtless, in some degree, owing to its mild purgative operations; but, to a still greater extent, to its alterative action. In most cases of this disorder, the liver is more or less implicated, and the relief of that viscus brings relief to the hæmorrhoidal vessels. I will only add, that both in the *common* and *blind piles*, the water is advantageously used, but more especially in the latter.

DISEASES OF THE URINARY ORGANS.

Incipient Calculous affections are occasionally submitted to the use of this water, and, for such cases, it has long maintained a reputation. Cases are said to have occurred, though none such have come under my observation, in which it displayed *lithontriptic* qualities.

The *palliative* effects of the water in calculous affections are often experienced to the great comfort of the sufferer; but it is only, I believe, in the earlier stages of such affections, that it can be regarded as better than a palliative.

Incipient *calculous* affection is relieved by the water pretty much in proportion as it corrects the digestive and assimilative functions, improves the blood, and brings the general economy into a natural type; preparing the kidneys to resist foreign encroachments upon their functions, and to elaborate, from healthy blood, proper and healthy secretions.

Although I do not claim for the water *solvent* powers, it may, nevertheless, exert both upon *renal* and *vesical calculi*, some directly modifying influences, by correcting the *Lithic Diathesis*, and, by an increased flow of urine, hurrying through the kidneys and bladder, the *lithates* and *phosphates*, which are usually the nucleus of calculi. I know, indeed, that persons while using the water, often void *considerable*

quantities of small calculi, with very little pain or inconvenience.

Chronic Inflammation of the Kidneys, as well as similar affections of the *Bladder* and *Urethra*, are often successfully treated by this water. I deem it a duty to allude to a very common error in the manner of using the water in these affections. I have reference to the practice of drinking it in large quantities, with the view of establishing copious discharges from the kidneys. By an imprudence of this kind, the cure of the case is not only prevented, but lasting injury inflicted in a superadded debility of the organs.

In these cases, the water should be so used as to keep up a gentle diuretic action for several weeks, carefully guarding against excessive discharges of this kind.

In cases of *chronic irritability* or *obstructions of the kidneys*, the medicinal agency of the water lies in its *alterative* and *deobstruent* effects, and the patient that fails to obtain these, fails to obtain permanent relief from its use. Hence, by those thus afflicted, it should be so taken as most effectually to secure these objects.

A mere *drenching* of the kidneys, or, as visitors sometimes express it, a "thorough washing out" of these organs, by constant and copious diuresis, is

worse than nothing; never permanently useful—often prejudicial.

I have reason to know, that many persons affected with disease of the kidney, hastily leave the springs in despair of relief, because their injudicious manner of using the water makes it act too freely and forcibly on that organ. As a general thing, such persons are more in fault than the water; for while such free action is injurious in such cases, it is perfectly in the power of a judicious use of it, or by the interposition of mild adjuvants, that have been frequently alluded to in this volume, to prevent this hurtful state of things; to give such patients the full benefit of its valuable alterative and deobstruent powers, and this, without any over-excitation, or exhaustion of the kidneys. The great importance of this fact to many sufferers, and the strange disregard that is paid to it by many, justify me in distinctly calling attention to it under this head.

DIABETES.

The nature of Diabetes is so imperfectly understood, that medical men do not agree as to the part of the body in which it is primarily situated. Some suppose that the kidneys are the original seat of the disease; others, that it depends on the state of the stomach; while it has been imputed by others to a diseased state of the blood. Its exciting causes are

numerous — such as over-exercise of the mind or body, use of spirituous liquors, excessive or improper indulgences, the depressing passions, etc. It is commonly connected with a depraved and shattered constitution, and it is often difficult, when physicians are consulted, to say whether it be the cause, or the consequence, of the constitutional deprivation.

It is often attended with indigestion, general debility, constipation of the bowels, thirst, dryness of the skin, and irregular, capricious, and sometimes voracious appetite. Its pathognomic symptom is a great increase in the flow of urine, which is generally of a pale straw color, sometimes insipid, but oftener of a sweetish taste, and faint smell, resembling that of violets, and containing a considerable quantity of sugar.

Cases of Diabetes have not been very numerous at the "White," but they have occasionally come under my observation. One of great interest fell under my notice some years since, in the person of Mr. S., a very intelligent gentleman from the State of Georgia. He was greatly emaciated, from the effects of the disease, but after using the water for some ten days, he commenced improving, and regained his flesh at the rate of a pound a day for a number of days. Another case was so far relieved last summer as to give me confidence in its ultimate cure.

In Diabetes, the water should be administered in

small and oft-repeated doses. The diet should be the most nourishing kinds of animal food, and in quantities suited to the strength of the digestive powers. The tincture of iron is useful in connection with the waters, and the hot sulphur bath is a valuable adjunct in such cases.

FEMALE DISEASES.

For the various forms of chronic female disease, such as AMENORRHŒA, or *suppressed menstruation;* DYSMENORRHŒA, or *difficult and painful menstruation, Chlorosis,* and *Leucorrhœa,* the water of the White Sulphur has been much employed. When the cases have been properly discriminated, and were free from the combinations and states of the system that contra-indicate the use of the remedy, it has often exerted marked good effect.

While these waters do not display the powers of an active *emmenagogue,* that they exert an influence upon the uterine system, independent of their general stimulant powers, is manifest from their tendency (when used during the periods) of increasing the periodical flow of females;—from the fact that they increase *menorrhagic* affections, and, from the unpleasant effects they occasionally produce in the early stages of pregnancy.

To say nothing of the value of the alterative influence of the water, as specially exerted upon the

organs which are the immediate seat of the diseases under consideration, its general *changing effects* upon the entire organism of the system, resulting in unlocking and liberating the various secretions, and, consequently, in restoring the glands, capillaries, and blood-vessels to a natural and healthy condition, is a great point gained in female diseases, and generally the concomitant, or immediate precursor, of a complete cure.

But the mere names, and actual existence of these several diseases, are not sufficient to decide as to the propriety of using sulphur waters in such cases. We must carefully note the peculiar temperament of the female, and her constitutional habitudes, her exemption from a phlogosed state of the system, from inflammation in the female organs, or elsewhere, and especially as to her freedom from tubercles of the lungs, or scirrhosity of the uterus.

In the early stages of pregnancy, the sulphur waters, if used at all, should be used with caution; and in case of predisposition to abortion in early gestation, it is safest to avoid them altogether.

It is most prudent for delicate females who are using the waters, and who are predisposed to too abundant, or too long-continued menstruation, to discontinue them for a few days during such periods.

While under the influence of sulphur waters for the cure of these diseases, ladies will often derive the

most material advantage from the use of the warm and hot sulphur baths.

A few years ago, a *Chalybeate Spring* was discovered and brought into use, within a few hundred yards of the White Sulphur fountain. Since that time, I have been much in the habit of prescribing small quantities of this chalybeate, to be used in connection with the sulphur water, in certain female diseases, and have often had occasion to be gratified with the practice.

CHRONIC AFFECTIONS OF THE BRAIN.

Some interesting cases of chronic inflammation and congestion of portions of the cerebral mass have been met with at the White Sulphur.

It is only since the discovery of the successful use that may be made of the water, after being deprived of its stimulating gas, that it has been prescribed advantageously in affections of the brain. I have never, indeed, seen a case of inflammation of this organ, in which the fresh water could be borne. When it is carefully deprived of its gas, however, either by *heating* or by being *kept for a sufficient length of time in an open vessel*, it agrees well with such affections, and I have, in many instances, prescribed it with happy results.

NERVOUS DISEASES.

The great increase of nervous diseases, within the last decade, must have attracted the attention of every observant individual.

Neuralgiă, in one form or another, has become the prevailing disease of the whole country. It has been but a few years since it was only known among us as a toothache from a denuded nerve, or in the form of the erratic but twinging *Tic douleureux*. Now it is not only the common, but the *fashionable*, disease of the country. Once it was the peculiar privilege of the wealthy and the luxurious to boast of their neuralgia, as the *parvenu* does of his gout; but now, the poorest, most unpretending subject can have his full share of this aristocratic affection. Formerly, a vulgar rheumatism took possession of the extremities, while a still more vulgar dyspepsia claimed the dominion of the stomach. But, how changed! Neuralgia now takes the limbs, and gastralgia the *primæ viæ*. Formerly, a fashionable lady, to induce a reluctant husband or father to make a pilgrimage to a fashionable watering place, was driven to a vulgar dyspepsia to effect the object; now, a "*little neuralgia*," which may be located just at her pleasure, will answer every purpose.

But, soberly, we are, and have been for ten years, living under the reign of a nervous *diathesis*, which

literally obliges every species of disease, acute and chronic, to wear its livery. The revolution that it has effected in the type and the treatment of disease is wonderful. To a large extent, even our fevers obey its behests, and hence *inflammatory* and *bilious* have almost given way in our nomenclature to nervous and typhoid.

In every acute disease, we are admonished that there is a prevailing constitution that inhibits the lancet and other rapid depletory practice, that so distinguished our country within the present generation.

The most apathetic are now obliged to yield to the regin of the nerves, and look around for a *placebo* that was formerly allotted to the most effeminate alone.

The various nervous affections, such as *neuralgia*, hypochondria, hysterics, chorea, etc. etc., are not unfrequently met with at the Springs. Sometimes as primary or independent diseases, but more frequently in connection with derangements of the digestive organs. The direct influence of the water in restoring the tone and energy of the general system, by removing obstructions and correcting the functional derangements of the organs, obviously points to it as a remedy in the latter class of cases. The invigorating effects of the salubrious and charming climate in which the spring is situated, and, I might add, the

advantage of the exercise necessary to reach it, are efficient auxiliaries in such cases.

In nervous diseases, especially under exalted nervous excitement, the water should almost invariably be used in small quantities at first, and *in its least stimulating form;* that is, after it has been deprived of its gas by standing at least twelve hours in an open vessel. In many cases it is indispensable that it should be suffered to stand even for twenty-four hours, or be gently heated, that its gas may be entirely thrown off before it is used.

It was in *nervous cases*, many years ago, that I was led to appreciate the advantage of administering the water in its unstimulating form; a practice that has effected a triumph over the former method of using it fresh from the spring, as complete as it has been beneficial to thousands of nervous individuals. After thus using it a few days, the patient will probably bear it fresh from the spring, and when such a tolerance is established, there is no objection to its being thus taken.

PARALYSIS.

In most cases, Palsy is the sequel of an attack of apoplexy, which has come on suddenly and unexpectedly. In other cases, however, it is brought on slowly and from causes that do not directly implicate the brain, affecting certain muscles only, leaving others of the same parts untouched.

Paralysis may be complete or incomplete; that is, the muscles affected may be totally or partially powerless. There are many other causes besides apoplexy, that produce paralysis; such as tumors, injuries caused by violence, cold, the action of poisons, excessive or improper indulgences, derangement of the digestive functions, etc.

When palsy occurs without being preceded by apoplexy, its approaches are generally gradual and connected with some appreciated derangement of the health.

A gentleman was under my care last summer with a decided paralysis of the entire right side, resulting from derangement of the chylopoiëtic viscera, in whom the disease came on so gradually, that he was unable with distinctness to designate the time of its first appearance. Another individual, an elderly gentleman, was under my direction the same season, with a paralysis that had been induced by injudicious perseverance in cold shower bathing. Although this was an unequivocal case of *hemiplegia*, barely enabling the patient to drag his *leaden-like* limbs along, it was preceded by no apoplectic shock, the gentleman being quite conscious of the occasion and progress of the attack. There are other cases in which the loss of power over the muscles takes place instantaneously, although not preceded by a distinct apoplexy.

The number of paralytics that resort to the White

Sulphur is large, and their success from the use of the waters has been various. Cases resulting from dyspeptic depravities are oftener cured than those from any other cause; but in almost every case some amendment of the general health takes place, notwithstanding the paralysis may not be removed. Warm or hot sulphur baths are useful in connection with the water, in most cases.

CHRONIC DISEASES OF THE CHEST—OR BREAST COMPLAINTS.

The public generally, and no portion more than valetudinarians themselves, are prone to be exceedingly loose, undefined and inaccurate in drawing distinctions between the different and dissimilar diseases that occasionally affect the same organs of the body. This is especially the case when such diseases have one common generic name; as, for instance, the name of "*Breast Complaint,*" which, by a comprehensive and sweeping application, is made to embrace, not only *Tubercular Consumption*, a disease of scrofulous origin, and generally, if not uniformly, incurable, but also a large number of other affections of the "breast," whose nature and termination are altogether dissimilar, and none of which, from their peculiar pathology, ought to be regarded as necessarily incurable.

The same want of discrimination that confounds

diseases affecting the same organ and of the same generic name, is prone, as might be expected, to confound the practice appropriate for their cure. This is constantly found to be the case in reference to the use of the White Sulphur water in *breast complaints.*

PULMONARY CONSUMPTION (*Phthisis Pulmonalis*) has, to an alarming extent, become a disease, of our country, and especially in the more Northern and Northwestern portions of it; yet, notwithstanding its frequency, it is unquestionably true, that many diseases, accompanied by wasting of the body, hectic fever, cough and mucous expectoration, are often classed with it, both by friends and medical attendants, where no scrofulous taint lurked in the constitution.

It is often embarrassing, even to the most experienced physician, to decide with clearness whether the lungs are the primary seat of disease, or whether they are merely the seat of a sympathetic irritation originating in some other organ. Nor can the practitioner always, with more than problematical conjecture, decide as to the existence or condition of tuberculous formations. But whatever may be the medical opinion as to the precise pathology of the disease, if the hectic flush be upon the cheeks, the vermilion upon the lips, the burning heat in the palms of the hands and soles of the feet, with even-

ing fever or cold colliquative sweats, connected with hollow, pale, languid countenance, sharpened features, purulent expectoration and progressive emaciation, constituting the ever-present symptoms of *Phthisis Pulmonalis*, the use of the water ought to be withheld.

The symptoms just enumerated are those that distinguish tubercular consumption in its ultimate or matured stage, and in which the use of the water would prove injurious; but in no stage of formed, or forming, tubercles of the lungs, should it be relied upon as a remedy.

But it by no means follows, either from sound reasoning in the premises, or from observation and experience, that the want of adaptation in the waters to *tubercular consumption* proves their want of adaptation to other forms of breast complaints. On the contrary, we know that the very best effects have often been derived from their use in various cases that seriously implicated the lungs.

Caution, however, should be exercised in submitting *breast affections* to the use of the White Sulphur water; and where doubts exist as to the nature of the case, a careful exploration of the chest should be made, and the best professional opinion elicited as to its true pathology. If tubercles in a mature or immature state are found in the lungs, prudence dictates the avoidance of the water; but if there be no tubercles, and no febrile excitement, it may be em-

ployed without fear, although there may be cough, mucous expectoration and other symptoms evidencing a morbid determination to the lungs.

I might give numerous cases illustrating the safety and success of the water in several forms of "breast complaints," unconnected with a scrofulous diathesis or tubercles, but I will give one only, and that because it is of very recent occurrence, and happened in the person of an intelligent young physician of my acquaintance.

Dr. H., of C., had been suffering for more than two years with an affection of the lungs, during which time he has had several hemorrhages, with two distinct attacks of apoplexy of the lungs; requiring, in each instance, active treatment for his relief. One of these apoplectic attacks, attended with hemorrhage, had occurred two weeks before I saw him. On his arrival at the springs, his pulse was one hundred and fifteen beats a minute, sense of fullness about the chest, with restlessness and general nervous excitability. I discouraged him from the use of the waters, under the apprehension of an increased excitement from their use, both in the vascular and nervous system, and advised him to visit the Red Sulphur, as offering a safer remedy. He disliked to make the journey, and determined to remain a few days at the White without using the water, and then return home. Under this state of things, and as he was a physician and could watch his own case intel-

ligently, I advised him to make a careful trial of the water in its *ungaseous* form; enjoining it upon him to discontinue its use if he found it to increase his pulse, and to persevere if the force or frequency of the pulse was reduced. The experiment was most fortunate; his pulse was reduced day by day, until it came down to its natural standard; the sense of fullness in the chest disappeared, the nervous excitement was assuaged, and in every respect, the amendment was clear and unequivocal; not evanescent, but progressive and permanent.

It is proper to state that Dr. H. made several attempts to take the water fresh from the spring, but always found it too stimulating, and was forced to return to the ungaseous water.

It would be impossible, without going into a very tedious dissertation on the nature and causes of the various diseases of the chest, (which would be foreign to the objects of this work,) to set forth, with such clearness as would be useful to the invalid, the various forms and modifications of *Breast Complaints*, for the cure of which the White Sulphur water may be safely and profitably employed. I shall allude here to but one of these forms, and to that, mainly because it is of very common occurrence and not unfrequently mistaken for *genuine* consumption.

I shall call this form of disease *Sympathetic Consumption*, because this name more clearly conveys a correct idea of its character than any other I can give it.

Sympathetic Consumption, although not peculiar to such, occurs most frequently in persons of some constitutional disposition to phthisical complaints. It is the result of morbid sympathies extended from some other parts of the body, and more commonly from a diseased stomach or liver. The great par vagum nerve, common to both the stomach and lungs, affords a ready medium of sympathy between those two important organs. In protracted cases of dyspepsia, the stomach often throws out morbid influences to the windpipe and surface of the lungs, occasioning cough, mucous expectoration, pain in the breast, and many other usual symptoms of genuine consumption. So completely, indeed, does this *translated* affection wear the livery of the genuine disease, that, as before remarked, it is often mistaken for it. This form of disease comes often under my notice at the springs, and I frequently witness the happiest result from the employment of the water in such cases; and the more so, because its beneficial effects resolve a painful doubt that often exists in the mind of the patient, as to the true character of his disease.

BRONCHITIS.

Bronchitis is often met with at all our watering places; sometimes as a primary affection of the bronchia, and often in connection with other diseases.

Of late, this has become an exceedingly common disease with the clergy of our country; so much so, as eminently to demand an investigation into the peculiar causes that render this invaluable class of men so subject to its influence. Such an investigation would not only be highly interesting as a curious subject of pathological inquiry, but also might be valuable by enabling the clergy to avoid the exciting and predisposing causes of the malady. It is not my purpose to enter into this investigation; it would be foreign to the objects of this work; but merely to observe, for the benefit of those thus afflicted, that the mineral waters of this region afford encouraging prospects of relief. We occasionally meet with cases that are relieved at this place; and similar results occur at all our watering places.

We often see *Bronchitis*, at the White, give way and disappear, in the same ratio in which the water exerts its alterative power over the digestive and assimilative organs. Dr. R., of Lower Virginia, was relieved of an obstinate attack in this way; an officer of our navy experienced the same good fortune.

CHRONIC DISEASES OF THE SKIN.

The sympathy existing between the surface of the body and the large internal organs, particularly the stomach and liver, has long been known and appreciated by medical men. The celebrated practice of

Abernethy, of directing his remedies to the stomach and bowels for the cure of cutaneous diseases, was based upon a knowledge of this sympathy. Dr. James Johnson, of London, in treating of the morbid sympathies of the organs, remarks, that in *Cutaneous and Eruptive* complaints, "an extensive class of diseases, whose treatment has hitherto been very puzzling, the stomach, in company with the liver and intestines, sympathizes to an extent that is little imagined;" and adds, "that from the midst of the most inveterate of these, there is scarcely one that is not more or less connected with derangements of the above-mentioned organs, but particularly the liver, and consequently under the control or influence of remedies directed to them."

I have very generally observed in the administration of sulphur waters for cutaneous diseases, that just in proportion as the great abdominal organs became alterated, the disease of the skin was relieved; nor do I anticipate any very decided amendment in such cases, especially if they be of long standing, until the water has exerted its sanatory effects upon those organs.

The warm *sulphur bath* is a valuable assistant to the internal use of the waters in cutaneous diseases, and should be daily employed after the water has begun to show its alterative effects upon the liver and bowels.

It is often exceedingly gratifying to residents at

the springs to witness the progressive disappearance of cutaneous eruptions, and ultimate recovery in the course of the season, of persons who come there with unseemly affections of this kind.

In *ill-conditioned ulcers* of the extremities, which are most generally found connected with some general depravity of the constitution, the water, in a general way, displays very fine effects. In such cases, I prefer the water to be so used as to make decided impressions upon the *bowels and skin* for a few days, to be continued afterwards in smaller and less operative quantities.

PSORIASIS AND LEPRA.

The waters of the White Sulphur have been extensively used, and generally with beneficial results, both in *Psoriasis* and *Lepra*.

Nothing short, however, of a full course of the water, resulting in creating, and for a considerable time in sustaining, its alterative action upon the system, can be relied upon as fully remedial in such cases. Valuable as I esteemed the water in these cases, I have not been in the habit for several years of relying exclusively upon it in the more formidable cases of either of these diseases. The various mineral and vegetable alteratives, especially iodine, or hydriodate of potash in full doses, will be found valuable adjuncts; and in

the declining stages of such cases, that is, after the eruptions are giving way, benefit is often derived from the use of Fowler's solution in small doses; which, however, must be promptly discontinued, if it occasion gastric uneasiness, swelling of the face, or muscular weakness.

Psoriasis and *Lepra* are diseases so alike in their origin and nature, as always to require essentially the same treatment; they are sometimes, in their early stages, easily cured; but often very obstinate, and, when relieved, are apt to return. Hence a mere *amendment*, under any treatment, should not be relied upon, but the course of treatment, to be effectual, must be long-continued and thorough.

In these diseases, the warm sulphur bath, timeously used, is very valuable. It should be employed daily, but not until the general system shall have been brought somewhat under the alterative influence of the water; used at an earlier period, it is always useless, and sometimes hurtful, by increasing local irritation or occasioning general fever.

In the summer of 1856 a young gentleman came under my advice, who had been for several years a a sufferer from *Lepra*. He was the son of wealthy parents residing in one of our large cities, and had been under the best medical advice of the country, but without essentially benefiting his condition. Both of his legs, from the ankles to the hips, were entirely covered with rough scales overlying in-

flamed and itchy surfaces, occasioning constant irritation and uneasiness, particularly at night. Under the free use of the water and bath, aided by the occasional administration of mild alteratives, the young gentleman had so entirely recovered in the course of eight weeks, as to induce me to advise him to leave the waters and return home. I saw him the next year and was gratified to find that his cure was entire and perfect.

Numerous cases, in no important respects dissimilar in their character or termination, are of frequent occurrence at the springs.

RHEUMATISM AND GOUT.

Next to diseases of the abdominal viscera, rheumatism is most frequently met with at our watering places. The ancient reputation of the White Sulphur, and that which at an early day directed public attention to its potency, was derived from its successful use in rheumatism. Tradition says, that the efficacy of this spring in this disease was known to the Indians while they dwelt in the country; and it is a matter of history that the first important cure, it is known to have effected among the whites, was in a disease of this kind. The reputation, thus early acquired, has not been lost, but, on the contrary, has become established by the experience of more than half a century.

It must be borne in mind, however, that it is not

adapted to every case of rheumatism. It is only in the *chronic form* of this disease, when active inflammatory action is not present, that it can be looked to for success.

We often see at our watering places, and particularly in persons from warm miasmatic regions, a form of rheumatism intimately connected with, and dependent upon, derangement of the internal organs. For the cure of such cases, the water is peculiarly adapted. The same discriminative and especial praise may be bestowed upon it in *Mercurial* rheumatism, which we occasionally find connected with chronic inflammation and enlargement of the bones. In most cases it will be advisable to connect the use of *warm* or *hot* bathing with the drinking of the water, and in many, especial advantage will be derived from the local application of this adjuvant in the form of a *douche*.

The united effects of these agents, operating for a sufficient length of time, rarely fail to relax the rigidity of the muscles, to give strength, ease, and elasticity to the diseased joints, and to impart vigor and tone to the whole system.

GOUT is not unfrequently seen at this, and at all our watering places. The general operative influences of sulphur waters, and the tone and energy which they impart to the digestive and assimilative functions, are often serviceable in this painful affection; and espe-

cially, when, with the use of the water, the patient pursues that prudent course of regimen which in this, not less than in other diseases originating in the stomach, is absolutely necessary to a cure.

As a palliative, the water is very generally serviceable.

DROPSIES.

The alterative influence of sulphur waters is often very conspicuously displayed upon the *absorbent* as well as upon the secretory system, and hence, under its use, dropsical effusions are often removed, while the general health and tone of the system is so improved as to prevent their re-accumulation.

In cases originating in, or dependent upon, obstructions of the glands, the sulphur waters may be used with great confidence.

There are no invalids, who drink the White Sulphur, that are more signally benefited by the use of active medicines in connection with it, than dropsical subjects. Indeed, in all such cases, appropriate medicines so increase the certainty and celerity of the action of the water upon the system, that their employment should never be overlooked or neglected by such patients.

SCROFULA.

Sulphur waters have long been held in reputation as a remedy for *Scrofula*. Dr. Armstrong, an emi-

nent practitioner, and long a resident physician at an English sulphur spring, states that he found the internal and external use of sulphur waters far more efficacious in scrofula than the common measures, for, after all the ordinary treatment had failed, he had seen scrofulous affections cured by drinking such waters, and using them as a tepid bath. Dr. Salsbury, who is familiar with the sulphur waters of *Avon*, New York, speaks favorably of their employment in such cases. My experience with the White Sulphur, in this disease, has given me some confidence in its employment, and especially in early stages of the affection. That it possesses considerable powers in resolving scrofulous tumors, I am satisfied. In the advanced stages of the disease, success has not been uniform from its employment; though, even in such, it is occasionally serviceable, and in no instances injurious, except in cases attended with ulcerations of the bowels.

The constitutional invigoration, and the amendment of the general health, from the use of the water, is often advantageously felt by scrofulous subjects who may not experience entire relief of their strumous malady.

In scrofulous and rickety children, affected with enlargement of the lympathic glands, or with a hard and tumid abdomen, evidencing disease in the mesenteric glands, the use of the water is found very beneficial, imparting new life and vigor to the young

constitution, resolving the induration and enlargement of the glands, and lessening the tumefaction and hardness of the abdomen. An ointment made of iodine, or hydriodate of potash, of such strength as not to excoriate the skin, may advantageously be rubbed over the enlarged glands or bowels during the use of the water; and the chalybeate water, or, in its absence, some of the artificial preparations of iron, may occasionally be interposed with advantage.

In the united use of sulphur and alum waters in these affections, there is a perfect compatibility, and the employment of the former, for a few weeks, often constitutes the best preparation for the use of the latter.

MERCURIAL DISEASES AND SECONDARY SYMPTOMS OF LUES.

In that enfeebled, susceptible, and very peculiar condition of the system, often found to exist as the result of a long-continued or injudicious use of mercury, the White Sulphur water displays its happiest effects. Indeed, its powers in overcoming and eradicating the constitutional and local effects of this drug from the system, deserve to be called extraordinary, and cannot be too highly appreciated by the medical profession or the public.

But it is especially to that anomalous, but not uncommon state of the system, produced by the unsuc-

cessful use of mercury in syphilitic affections, that I desire particularly to call attention in reference to the use of the water.

Under the combined influence of mercury, and the peculiar virus of *lues*, a new and peculiar state of the system is sometimes induced, dissimilar to the ordinary syphilitic developments, and also from the symptoms of a common mercurial disease, a case *sui generis;* and unmistakably manifested by the production of certain constitutional and local symptoms, both annoying and painful, and not unfrequently inducing great irritability of body and mind, with feelings of wretchedness and despondency.

This peculiar disease, evidently one of constitutional character, manifests its existence by florid or livid spots, or blotches, on various parts of the body; by scaly eruptions, and, in its ultimate form, by ragged, ill-conditioned ulcers, assaulting indiscriminately any portion of the body; by nodes, or enlargement of the bones, most generally of the extremities, or the face; ulcerated throat, pains in the limbs, with great susceptibility to pains and aches from changes of the weather, or from any slight influence of cold. The whole of these symptoms may not be present, or in force at the same time, or in the same patient, but they are all generally developed in the progress of such cases. In the commencement of the disease, there may be no symptoms to attract attention, except a tendency to discoloration

in small irregular circles on parts of the body, or a brand-like scaliness on portions of the skin, with an augmented susceptibility to the influence of cold, or to sudden changes of the weather. Such symptoms will generally be found to be the incipients of this formidable malady, and which, if the disease be not then cured, are but the precursors of the more loathsome and dreaded symptoms.

Cases of this character are found to exist, in greater or less severity, in all the varieties of constitution and temperament; but more frequently and more severely in delicate persons of lymphatic temperament, and especially in such as are predisposed to strumous diseases.

After long experience of the use of the water in the peculiar form of disease under consideration, I have no hesitation in saying, that if called upon to designate the particular affection, or state of the system, in which the White Sulphur water is most certainly beneficial, I would not hesitate to name *mercurial diseases with secondary symptoms of lues;* because the water in such cases exerts a specific agency, and more certainly brings relief to the sufferer, than any other known agent. This is strong praise of the remedy in this disease, and nothing but long and successful experience in its use would induce me to award it.

I use the phrase *specific*, a term, I know, as applied to remedies, not much favored by the schools

of medicine; but by what other term can we better designate the peculiar and constant aptitude of a remedy to produce always the same results?—as mercury in its peculiar action upon the salivary glands, or as the White Sulphur water in its effects upon mercurial disease, for it is not more certain that mercury will salivate, than that the character of disease under consideration will be beneficially influenced by the proper use of the White Sulphur water.

For more than twenty years I have watched the operation of these waters in the disease under consideration, and, within that time, hundreds of cases have been submitted to their use; and I can say of their employment in such cases, what should not be said of them in any other without qualification, that they have invariably, when properly used, either *cured*, or so *relieved* the patient, as to evidence the triumph of the remedy over the disease.

Patients laboring under this affection, and, in some respect, in proportion to the violence of the case, are required to exercise patience and perseverance in the use of the remedy. To render it fully successful, nothing short of its complete and pervading alterative influences can be relied upon, and, to effect this, in bad cases, from one to three months' use will generally be required; occasionally intermitting it for a few days, if it has to be very long continued.

In treating such cases with sulphur water, great advantage will be gained and much time saved, by

the administration of appropriate adjunctive remedies, and by the free use of the warm and hot sulphur baths, interposed after the water has, to some extent, affected the general system.

ERYSIPELAS.

There is a form of Erysipelas which I shall call *habitual*, because of its frequent occurrence in the same individual, that attacks, at irregular periods, any part of the body; but, most commonly, the face, neck, or the other extremities. This affection sometimes obstinately maintains the seat in which the inflammation first appears; in other cases it extends with greater or less rapidity to adjacent parts of the body. It may occur with any one, but it especially prevails in persons constitutionally predisposed to the affection, and in such, being routed from one part, it will attack another; or at irregular intervals, and from various exciting causes, such as cold, improper diet, etc., it will return and re-assault the parts formerly its seat. The disease is attended with an unpleasant burning in the parts affected, and generally with a slight fever in its early stage, which is preceded by rigor or chilliness. It is a disagreeable and annoying affliction, and showing, even when slight, a strong predisposition to a more serious form of the same disease; persons affected with it, however mildly, are anxious to be entirely relieved.

For this form of erysipelatous inflammation, the White Sulphur is a valuable remedy. Many such cases come under my direction, and by the use of the waters generally, and mild alterative applications locally to the affected parts, they have very generally been cured.

It should be noted that, while the inflammation is active, or even slight fever exists, the water should be withheld.

DISEASES OF THE HEART.

To guide intelligibly and safely in the administration of mineral waters, it is as necessary to observe and note the diseases and states of the system in which such agents are *contra-indicated* and hurtful, as those in which they are beneficial.

I have elsewhere alluded to the injurious effects of mineral waters in organic affections of the heart; but the subject is one of so much importance, and mistakes are so frequently made by unadvised, or badly advised, persons, that it seems proper to call attention more distinctly to it.

Hypertrophy, or thickening of the heart, the most common, as well as the most formidable, chronic affection of that organ, is properly divisible into three varieties; the first consisting of a thickening of the muscular tissue of the organ, without material alteration of the valves, or enlargement of the cavi-

ties of the viscus. In the second variety the thickness of the walls of the heart are increased, but principally on the inside, so that while the size of the whole organ may not be much increased, its cavities will be considerably lessened. The third variety is hypertrophy or thickening of the walls, combined with dilatation, of greater or less extent, of the cavities; this is the most serious and dreaded variety of the disease.

In neither of the varieties of hypertrophy of the heart, is the White Sulphur water remedial; while in the second and third, it is manifestly injurious and hazardous, even when used in moderate quantities and for short periods of time. Such will be, to a greater or less extent, the prejudicial effects of all the more stimulating waters, whether of Sulphur, Alum, Chalybeate or Saline character.

In the last twenty years I have known several cases of sudden death, in hypertrophy of the heart, occasioned by using the White Sulphur water. In numerous other cases, an aggravation of all the worst symptoms of the disease has been witnessed from the same cause, and the patients forced to discontinue the water, although the *general state* of their systems, apart from the condition of the heart, demanded its use.

Experience of the injurious effects of the water in organic affections of the heart, has taught me the importance of carefully looking to the condition of

that organ, in all cases submitted to my advice, when there is the slightest reason to suspect that it may not be free from disease.

Let me be understood here, as alluding strictly to *organic affections* of the heart, and not to the various *sympathetic affections* of that organ, so often found, especially in persons of nervous temperaments, and in connection with dyspeptic depravities. Such sympathetic affections manifested by paroxysmal palpitations, and an awful sense of sinking, are not uncommon in dyspepsia; and, although always distressing, are less dangerous than patients are prone to fear They are neuralgic in character, and while they excite on the mind of the sufferer the most unpleasant anxiety, in fear of an organic affection of the heart, such fears are generally groundless. The existence of the unpleasant symptoms alluded to, when found in connection with, and dependent upon a dyspeptic condition of the stomach, in no respect contra-indicate the use of the waters; on the contrary, these unpleasant symptoms are always relieved by the use of the water to the same extent that it benefits the disease upon which they depend.

Patients suffering under *organic* affections of the heart should abstain from the use of sulphur waters, although the state of their general system may seem to indicate the use of the remedy. Most persons, thus advised, carefully adhere to the advice, but in a few instances I have known them to depart from it

and use a few glasses of the water; but never without occasioning an aggravation of their symptoms. In such diseases I am occasionally consulted by persons who have been using the water for a time, and finding they are not doing well, seek advice; in such cases, a discontinuance of the water always gives evidence of its unsuitableness to the patient.

During the summer of 1856, one of my patients was an eminent physician, Dr. G., of Eastern Virginia. In detailing to him, in a social professional way, the prejudicial effects of the water in diseases of the heart—and without suspecting that he was a subject of the malady, for at that time I had not examined his case,—he manifested an acute interest in my recital, and before I had concluded, said, "You are not aware, sir, that you are using the *argumentum ad hominem;* I have long suspected that I am myself a subject of hypertrophy of the heart,—and what you now say of the peculiar symptoms occasioned by the use of the water in such cases, painfully satisfies me that I have not been mistaken." He further told me that he found his unpleasant symptoms aggravated almost immediately after commencing the use of the water; and I had the pleasure of witnessing a great abatement of them, after he discontinued its use entirely.

Cases have come under my notice in which the use of the water plainly developed to observation, the existence of a diseased heart, which, before its use, had been doubted or unsuspected.

SCIRRHUS AND CANCER.

In *Cancerous* affections, I have not found the waters of the White Sulphur to be remedial.

In *Scirrhus*, which may be regarded as an approximation to Cancer, or rather the initial of that formidable disorder, the same remarks may be made. Indeed, my observations are very unfavorable to the use of the waters in Scirrhus generally, and especially in schirrosity of the stomach and womb. Its tendency is injurious in such cases, and especially in their advanced stages; so much so, that I never recommend, but always inhibit, its use when there is sufficient cause to believe these organs to be in such a condition.

So far as observation enables me to form an opinion, and various cases have contributed to the enlightenment of my judgment on the subject, none of our mineral waters, either Sulphur, Chalybeate, Alum or Saline, can be regarded as remedial in Scirrhus or Cancer; and the best encomium that can be bestowed upon any of them in such cases, is simply this, *that the least potent will be the least injurious.*

We often meet in practice with *ill-conditioned ulcers* that are very unmanageable by the usual medico-surgical treatment; such ulcerations are generally connected with advanced age, or with a debilitated and vitiated constitution.

These disorders are successfully treated by our

stronger sulphur waters, and by the various Alum, or Aluminous sulphated Chalybeates of the country. Cases of this character, that are cured by mineral waters, have sometimes long resisted the usual medical treatment; and this fact, in connection with their *ill-conditioned* character, sometimes causes them to be regarded as cancerous. Patients, especially, taking counsel from their fears, often attribute to them this malignant character, but a wise and discriminating pathology will distinguish between such affections and the specific characteristics of Cancer.

CHALYBEATE SPRING.

About forty rods from the White Sulphur Spring, and near the road that leads to Lewisburg, is a *Chalybeate Spring*, which is now being beneficially used by invalids. The existence of this iron water has long been known, but it is only within the last few years that it attracted sufficient attention to induce the proprietor to have it deepened, walled up, and properly inclosed.

The water has not been analyzed, but there can be no doubt that the efficient medical material in it is *iron*, and that this is held in solution in the form of a carbonate, constituting the mildest, least offensive, and, ordinarily, the most efficient, form in which ferruginous waters are found.

I allude to this spring in connection with the

White Sulphur, because it is found immediately contiguous to it, and is used in connection with it to a considerable extent.

For the last ten years, it has been much used by invalids, either in connection with the White Sulphur, or as an independent remedy, and its tonic effects in several cases, that have come under my observation, have been gratifying. Judging from the taste of the water and its kindly influences upon the stomach, I infer that it is, to a great degree, exempt from the irritating salts that impregnate the waters of limestone regions.

It acts mildly as a diuretic, and slightly on some persons as an aperient, but its chief value must be attributed to its *tonic* powers.

CHAPTER IX.

SALT SULPHUR SPRINGS.

THESE springs, three in number, are about twenty-four miles south from the White Sulphur, in the County of Monroe, and near Union, the seat of justice for that county. They are encircled by mountains on every side,—having Peters' Mountain to the south and east, the Alleghany to the north, and Swope's Mountain to the west, near the base of which are the three springs alluded to.

This watering place has been a popular and profitable resort for invalids for the last fifty years; having always heretofore, as now, enjoyed a high reputation, alike for the virtue of its waters and the excellence of its accommodations. It is owned by Messrs. Erskine & Caruthers, worthy and enterprising proprietors, under whose personal management the establishment has been for many years, and who made the principal improvements at the place—which are both comfortable and extensive; being sufficient for the accommodation of three hundred and fifty persons.

The "*Salt Sulphur*" proper was discovered by Erwin Benson, Esq., in 1805, when boring for salt water, which he was induced to believe might be found there, from the fact that, in *old times*, the spot had been a favorite "Lick" for deer and buffalo. This spring is neatly inclosed in a marble reservoir, two feet square, and about two feet ten inches deep, and is protected from the weather by a neat and comfortable edifice.

The following is the *analysis* of this water, as furnished by Professor Rogers:—

Temperature variable from 49° to 56°.

Solid matter procured, by evaporation, from 100 cubic inches, weighed, after being dried at 212°, 81·41 grains.

Quantity of each solid ingredient in 100 cubic inches, estimated as perfectly free from water:—

1.	Sulphate of lime	36·755 grains.
2.	Sulphate of magnesia	7·883 "
3.	Sulphate of soda	9·682 "
4.	Carbonate of lime	4·445 "
5.	Carbonate of magnesia	1·434 "
6.	Chloride of magnesium	0·116 "
7.	Chloride of sodium	0·683 "
8.	Chloride of calcium	0·025 "
9.	Peroxide of iron, from proto-sulphate	0·042 "
10.	An azotized organic matter, blended with sulphur, about	4 "
11.	Earthy phosphates	a trace
12.	Iodine.	

Volume of each of the gases contained in a free state in 100 cubic inches:—

Sulphuretted hydrogen	1·10 to 1·50 cubic inches.
Nitrogen	2·05 "
Oxygen	0·27 "
Carbonic acid	5·75 "

The above analysis applies to the Iodine, or New Spring, as well as to the Upper, or Old Spring, as the following extract of a letter, from Professor Rogers to the proprietors, will show:—

"I inclose you a list of the ingredients in the Salt Sulphur water, which applies to the New as well as to the Old Spring, the former having rather a smaller amount of saline matter in general, though in some ingredients surpassing the other. It has been very minutely analyzed, and is the first of all the waters in which I was enabled to detect traces of iodine, which it contains in larger amount than the Old Spring, and, indeed, than most of the other waters in which I have been so fortunate as to discover this material."

The *Iodine*, or *New Spring*, was accidentally discovered by the proprietors in 1838, while engaged in opening a drain for the water of the "Salt," and was immediately deepened and inclosed in a marble reservoir, and covered by an appropriate building. Owing to a large deposit of sulphur in combination with some peculiar organic matter, which floats as a

pellicle upon the surface of the spring, this water is less limpid than that of the "Salt." Under an intense heat of the sun, it occasionally deposits a beautiful pink sediment upon the bottom and sides of the reservoir. In taste and smell, it much resembles the water of the other springs, but being *ten degrees* warmer, is less palatable to some persons. Its temperature varies from 62° to 68° Fah.

The presence of a larger quantity of iodine in this spring, *points* it out as a superior agent in many affections for which iodine is successfully employed, particularly in scrofula, goitre, and some diseases of the skin.

The Upper, or *Old Spring*, was discovered in 1803, by Alexander Hutcherson, Esq., who was searching for salt water on Indian Creek. It soon came into high reputation as a mineral water, and was the annual resort of a large company. The house now occupied as a hotel, and several of the old cabins, were erected at that early day. The water of this spring is now almost exclusively used for the baths; the opening of the *Salt Sulphur* proper, whose waters are more strongly marked, having in a great degree superseded it as a drink.

The water of the Salt Sulphur possesses all the sensible properties of the sulphur waters in general. "Its odor, for instance," says Dr. Mütter, "is very like that of a 'tolerable egg,' and may, in certain

states of the atmosphere, be perceived at some distance from the spring, and in taste it is cousin-german to a strong solution of Epsom salts and magnesia. In a short time, however, strange to say, these disagreeable properties are either not observed, or become, on the other hand, attractive; indeed, there is hardly an instance of an individual's retaining his original repugnance to them longer than three or four days, and some there are who become so excessively fond of the water as to give it the preference over any other liquids. Like most of the sulphurous, this water is perfectly transparent, and deposits a whitish sediment, composed of its various saline ingredients, mingled with sulphur. It is also for the most part placid; occasionally, however, it is disturbed by a bubble of gas, which steals slowly to the surface, where it either explodes with a timid and dimpling smack, or is eagerly caught up by some care-worn and almost world-weary invalid as a gem from the treasury of Hygeia!"

The Salt Sulphur water is remedial in all cases for which strong sulphur waters are successfully used; and especially in cases that require active cathartic operation. While its cathartic effects are more active than those of any other water in the geological region in which it exists, it is neither harsh nor violent; gently clearing the alimentary canal without debilitating the patient, while it actively promotes the general secre-

tions, invigorates the appetite, and promotes digestion. The cathartic effects of the water, are so mild and certain, that the stomach is never oppressed nor the bowels irritated; but while the alimentary canal is being relieved, the functions of the system assume their physiological type, and the suspended causes of disease are gradually removed.

In the extensive range of diseases, dependent upon *visceral* obstructions, the Salt Sulphur is eminently useful; and in that particular form of simple *Dyspepsia*, in which constipation is a leading and troublesome symptom, I have found it to be signally efficacious.

This water, like all our sulphur waters, will sometimes distinctly reduce the frequency and force of the pulse; and while such effect upon the circulation is not characteristic of its constant action upon the economy, it is favorable to its sanative influence. As is the case with the White and other sulphur waters, this influence upon the circulation is not the effect of direct sedative action upon the heart and arteries, but of the sanative powers of the agent, as an alterative and deobstruent, in restoring the general economy to its true physiological type, and thus relieving the circulation from the causes that oppress it.

Dr. Mütter, in an instructive pamphlet on the Salt Sulphur, published in 1850, recommends these

waters in *chronic affections of the Brain; in chronic diseases of the Bowels, Kidneys, Spleen, and Bladder; in Neuralgia*, as well as in the various affections termed *nervous*, such as hypochondria, hysteria, catalepsy, chorea, etc.

He found them useful in *sympathetic affections of the Chest*, dependent upon some lesion of the chylopoietic viscera; but cautions against their use in all cases of tubercles, hæmoptysis, or of great emaciation with diarrhœa.

Chronic Splenitis, often a sequela of Southern fevers, is frequently cured by these waters. Chronic gastric irritation, *Pyrosis*, or water-brash, as well as *Gastralgia*, or nervous dyspepsia, is often relieved by the Salt Sulphur.

Dr. Mütter found good effects from the waters in *constipation of the bowels*, hæmorrhoids, and in irritation of the mucous membrane of the *kidneys, urethra, prostate gland*, and *bladder*.

Beneficial effects are derived from their use in *atonic leucorrhœa, amenorrhœa*, and *dysmenorrhœa*, when unconnected with general or local plethora.

Like all other strong sulphur waters, they are beneficial in *chronic Rheumatism* and *Gout*, as well as in *Periostitis*, and inflammation of the bones, and *chronic diseases of the Skin*.

In reference to the manner of using sulphur waters, Dr. Mütter judiciously remarks, that "a very injuri-

ous practice prevails at most of the watering places in this country. It is supposed by many that taking the water directly from the spring, contributes very much to its efficacy, and, consequently, we find the *sick* and *feeble*, as well as the robust, sallying forth by break of day for this purpose. * * The water is undoubtedly more palatable when taken in this way, but it is not more *efficacious* than when drunk at the cabin." "Every invalid," he continues, "should bear this in mind, particularly those who visit the White Sulphur Springs."

THE SALT SULPHUR IODINE SPRING has attracted increased attention the last few years, and a recent analysis of its waters by Dr. David Stuart, of Baltimore, gives a sanction to medical anticipations as to its peculiar virtues and appropriate applicability. The following are the results of Dr. S.'s chemical investigations:—

IODINE SPRING.

One wine gallon of the water contains:—

Sulphuretted hydrogen	19·19	cubic inches.
Carbonic acid	34·60	"
Oxygen	00·62	"
Nitrogen	04·73	"
Total gaseous contents	59·14	"

SOLID CONTENTS OF ONE GALLON.

Sulphate of magnesia	20·00	grains.
Sulphate of soda	24·00	"
Carbonate of lime	33·00	"
Carbonate of magnesia	07·00	"
Chloride of magnesium	00·28	"
Chloride of sodium	01·28	"
Chloride of calcium	00·56	"
Silicic acid	01·76	"
Carbonate of potash	02·33	"
Carbonate of soda	10·80	"
Sulphate of lime	68·00	"
Iodine	00·93	"
Bromine	00·65	"
Sesqui-oxide of iron	01·06	"
Alumina	00·18	"
Phosphate of soda and lithia	00·73	"
Total solid contents	172·48	"

Specific gravity, 1002·7—reaction alkaline. Temperature 64·75 to 65·50 Fahrenheit.

This analysis presents this water as an interesting and somewhat peculiar medical agent, differing in some respects from any of the sulphur springs in this region.

The discovery of *iodine* in this water, some twelve years ago, by Professor Rogers, has led to its successful use in various disorders for which that article is known to be a reliable remedy. In addition to the diseases already mentioned for which the *Salt*

Sulphur proper is advised, the *Iodine Spring* will be found especially serviceable in the various *glandular affections*, mercurial rheumatisms, secondary syphilis, enlargements of the spleen, hepatic disease, mesenteric obstructions, and chronic exanthemata.

CHAPTER X.

RED SULPHUR SPRINGS.

THE Red Sulphur Springs are in the southern portion of the County of Monroe, forty-two miles south from the White Sulphur. They are distant seventeen miles from the Salt, thirty-nine miles from the Sweet, and thirty-two miles from the Blue Sulphur.

These springs have been known and distinguished as a watering place for more than fifty years. The improvements at the place are extensive and well-designed, combining elegance with comfort, and are sufficient for the accommodation of three hundred and fifty persons.

The water of the spring is clear and cool, its temperature being 54° Fahrenheit.

The following is Professor Rogers's analysis of the water of this spring:—

"GASEOUS CONTENTS IN AN IMPERIAL GALLON.

Sulphuretted hydrogen	4·54 cubic inches.
Carbonic acid	8·75 "
Nitrogen	4·25 "

"*Solid contents* of thirty-two cubic inches of water, gr. 1·25, consisting of sulphate of soda, lime and magnesia, carbonate of lime and muriate of soda.

"Besides these ingredients, the water contains, in

considerable quantity, a peculiar organic substance, which, mingled with sulphur, is deposited on the sides of the spring, and seems to increase by a species of organic growth."

Mr. Augustus A. Hayes, of Roxbury, Massachusetts, has also analyzed this water, and apparently with great care. The following are the results of his chemical examinations:—

"50,000 grains (about seven pints) of this water afforded by slow evaporation in air at 200° F., a light yellowish-brown matter, which, after it had been carefully dried, weighed 20 56-100 grs. At the temperature of 240° F., this residue becomes changed, and suffers a loss of weight, being reduced to 17·55 grs.

"This residue contains the saline part of the water, and is composed of—

Silicious earthy matter, containing traces of oxide of iron and alumina, probably suspended merely	0·70
Sulphate of soda in a dry state, which forms with the water 802 grs. Glauber's salts.	3·55
Sulphate of lime	0·47
Carbonate of lime, dissolved in carbonic acid.	4·50
Carbonate of magnesia, dissolved in carbonic acid, and forming the 'fluid magnesia.'	4·13
A peculiar substance, containing sulphur combined with organic matter	7·20
	20·55

"There are traces of chlorine, or muriatic acid, in some specimens, but at most only 0·03 of chloride of silver could be separated from 10,000 grs. of water. This substance is rarely absent from natural waters, which have penetrated the earth.

"The peculiar sulphur compound which forms a part of the saline contents of this water, has never been described, if it has ever before been met with. While in the natural state, and out of contact with atmospheric air, it is dissolved in the water, and forms a permanent solution. Air, acids, and other agents separate it from the water, in the form of a jelly, and alkaline carbonates, alkalies, water, and other agents redissolve it. It has no acid action on test fluids, but bears that character with bases, and forms compounds analogous to salts. In its decomposition, ammonia is formed, and hydro-sulphuric acid is liberated; or if heat be employed in the experiment, sulphur is separated. It combines with the oxide of silver, and forms a salt of a reddish-purple color, in the form of a flocculent precipitate, which dissolves in pure water; with the oxide of lead, a yellowish-white powder; and with the oxide of copper, a pale-blue salt in fine powder. In these compounds it remains unaltered, and may be separated from them and transferred to other bases.

"Mixed with a small quantity of water, and exposed to the temperature of 80° F., it decomposes,

and emits a most offensive odor of putrefying animal matter, with hydro-sulphuric acid gas. It is to this property that the hydro-sulphuric acid in the water is due, and to the oxidation of a part of this compound most of the sulphuric acid found in the water may be referred."

Mr. Hayes remarks, that "Chemical experiments do not show the medicinal properties of the substances operated on. But when a substance, the result of delicately balanced affinities, gives in its decomposition an agent of powerful action on the animal system, we may conclude that it is an active ingredient, if found in a water possessed of high curative powers. I am disposed, therefore, to consider the sulphur compound in this water as the principal medicinal agent contained in it; although its action in combination with the other constituents may be necessary to produce the effects for which this water is so justly celebrated.

"The following results give in one view the composition of this water:—

"Gaseous contents of a gallon, or 231 cubic inches of the Red Sulphur Spring water—

Carbonic acid	5·750
Nitrogen	6·916
Oxygen	1·201
Hydro-sulphuric acid	0·397
	14·264

"50,000 grs. (nearly seven pints) of this water contain dissolved as gases, (grain measure)—

Carbonic acid	1245
Nitrogen	1497
Oxygen	260
Hydro-sulp. acid	86
Grain measures of gases	3088

"50,000 grs. of this water afford of—

Silicious and earthy matter	0·70
Sulphate of soda	3·55
Sulphate of lime	47
Carbonate of lime	4·50
Carbonate of magnesia	4·13
Sulphur compound	7·20
Carbonic acid	2·71
	23·26

Mr. Hayes, from chemical examinations, comes to the conlusion, that the *red color* of the matter, which is deposited on the slabs, etc. is that of moss or lichen, which finds its habitat in the viscid covering produced by the deposition of the sulphur compound.

The peculiar and distinguishing reputation of this water, as a medicinal agent, is for diseases of the thoracic viscera, and, by some, it has been considered remedial in confirmed tubercular consumption. Without affirming or controverting this high claim for the water as a remedy in *confirmed consumption*, my

observations for many years enable me to award to it decided efficacy in many cases of *irritation* of the pulmonary organs.* In sympathetic or translated affections of the lungs, whether that state be occasioned from disease of the digestive or chylopoietic viscera, or be dependent upon the retrocession of some habitual discharge, the water deserves to be regarded as a valuable remedy.

A distinguished physician of South Carolina, who passed the summers of 1822, 1823, and part of 1824, at the Red Sulphur Spring, after giving a detailed report of three cases of pulmonary irritation connected with hæmoptysis that were cured by the use of this water, under his own observation, makes the following judicious and sensible observations in reference to its powers in such cases: "I do not wish to be understood as stating that the water of the Red Sulphur will cure confirmed phthisis, or tuberculous consumption; but I believe we are very often mis-

* In a work just issued from the Philadelphia press, entitled "*The Mountain*," our volume is referred to as showing that this water *cures* "*confirmed consumption*." We need scarcely say to our careful readers that it is a mistake to ascribe such an opinion to us; and that we never held or taught that this, or any other sulphur water should be regarded as "curing" that, as we believe, incurable affection. We are satisfied that the error on the part of the author of "The Mountain" was entirely unintentional.

taken in supposing a case of pulmonary irritation more desperate and hopeless than it really is, and I believe that in most cases, if this spring is resorted to early, and the clothing and diet and exercise duly attended to, its waters will be found a most powerful adjunct and assistant, in the management of these hitherto unmanageable cases."

The late Dr. Huntt of Washington, in his pamphlet on the Red Sulphur, remarks, that "on examining the visitors laboring under pulmonary disease, I observed that all those patients who drank the water so as to act freely on the bowels, for any length of time, did not improve in their health, because active purging is not proper for the lungs in this disease. The water must be drunk in such quantities as to act freely on the kidneys. There seems to be an intimate association between the lungs and the kidneys, and the kidneys seem to be the great emunctories by which the lungs are relieved in all pulmonary diseases. This idea has been repeatedly suggested to me in my attendance on patients laboring under this disease. On inquiring into their condition, they have frequently said, 'I feel much better to-day; I have had a most copious flow of urine, which has afforded me great relief.' This view of the connection between the lungs and the kidneys has been confirmed by witnessing the diuretic effects of the Red Sulphur water in pulmonary diseases. I have a friend, who is a physician, and who has labored,

more or less, under pulmonary disease for twenty years. He informed me that whenever his lungs were disturbed by irritation he always resorted to 'cooling diuretic medicines for relief.'

"There were but few persons laboring under the third or last stage of tuberculous disease, who visited the Red Sulphur this season, and among those few, there was scarcely a case that derived any advantage from the use of the water. When tuberculous disease arrives at this stage, and the constitution is broken down, it is not only *useless* but *cruel* to send the patient to the Red Sulphur. I am sorry to say, that several of my patients in this condition, by my advice, visited the Red Sulphur this season, and I witnessed the bad effects of the water in their cases, as well as in the cases of others of a similar character. They were laboring under that peculiar irritation, and perhaps ulceration, of the bowels, so common in this stage of the disease. They were unable to drink but a small quantity of the water, and the consequence was, that the bowels were purged and griped, the secretion of the kidneys was not increased, and the patient grew worse daily.

"The Red Sulphur has been considered peculiarly adapted to the cure of pulmonary diseases, and it is true that it has a most beneficial influence in most cases of this disease; but its good effects equally extend to all cases of subacute inflammation, whether seated in the stomach, liver, spleen, intestines, kid-

neys, bladder, and most particularly in the mucous membrane.

"It is also used with good effects in chronic bowel complaints, leucorrhœa, gleet, catarrh of the bladder, and in some forms of uterine derangement.

"Many persons arrive at the Red Sulphur, who are not prepared to use the water, in consequence of high inflammation, or congestion of the lungs, or other organs, attended with pain in the side, constriction at the breast, or hot and restless nights, with a quick, sharp pulse; all such cases must have the vascular excitement subdued before the water can be taken with any advantage."

Dr. Huntt gives the following directions for the use of the water:—

"If the system should be too plethoric, or too much excited, the use of the water should be postponed until the excitement shall be reduced to a proper state. Commence by taking one glass of water at bed-time, and one before breakfast; after a few days, take two glasses at bed-time, and two before breakfast, one at 11 o'clock A.M., and one at 5 P.M.; this quantity will generally operate freely on the bowels; if it should fail to produce this effect, a little common salt, magnesia, or cream of tartar may be added. If it is desired to act on the kidneys, increase the quantity of water to three or four glasses between a light supper and bed-time,

and the same quantity between daylight in the morning and breakfast-time, two glasses at noon, and one or two glasses about 5 o'clock P.M., taking care to exercise freely after drinking. The most proper periods for using the water are, at night before bed-time, and in the morning before breakfast-time."

Dr. B. Chrisman, a well qualified physician, and favorably known to many of the recent visitors to the Red Sulphur, and who resides there as a medical adviser during the watering seasons, has, in response to my request, furnished the following statement of his observations of the use of these waters during the season of 1857–58:—

"When I first went to the Red Sulphur to practice my profession, I had but poor hopes of realizing any confirmed proof of its really valuable healing powers. I silently observed its effects upon visitors afflicted with *laryngitis*, *pharyngitis*, *tracheitis*, *aphonia* and *phthisis* in many of their phases. Some were bad cases, with night-sweats, emaciation, diarrhœa, hectic acerbations, obstinate coughs, profuse expectoration, with general debility and rapid feeble pulse. In several cases I saw such amendment from the use of the waters as surprised me; consequently, my opinion as to its efficacy underwent a revolution, and I now regard the Red Sulphur as a medicinal Mecca, worthy the pilgrimage of the consumptive, who can conveniently make it; for to such, it affords not only com-

fort, but solid hope, except in the last and worst stages of the disease.

"I was invited to examine the lungs of one of my acquaintances. Upon percussing the chest, I found flatness, positive dullness of sound over one entire lung. Auscultation evinced scarce any vesicular murmur, and very little air entered that lung; hectic twice daily, pulse about one hundred, sometimes more frequent; complexion very sallow, etc. What was I conscientiously to do? I thought death to be likely approaching. Should I advise an immediate trip homeward to a distant Southern State, in the hot weather? I determined to trust to Providence and the waters; and in a short time I saw this person so far recovered as to run down a long embankment like a child, and to laugh until the area around resounded to the peals.

"In another case which I examined, the physical signs were dullness on percussion from apex to the centre of the lung, scarcely any vesicular murmur; prolonged respiration and blowing sound; cavernous respiration and *pectoriloque* at one point. I diagnosed a large dry cavity; feeble, pale, emaciated; pulse above a hundred, sometimes one hundred and twenty, vomiting meals, hectic daily, night-sweats, diarrhœa, and hæmaturia. What was I then to do? I could not advise her to return to her home to die; the water afforded a better hope. In ten days this

lady was taking healthful walks, and soon, good-Samaritan-like, she was visiting the sick, dispensing such cheer and comfort as few could give.

"I found much benefit from the soothing effects of the water in neuralgia, in the hysteroid affections as well as in nervous palpitations of the heart, etc. Its influence upon the pulse was often noticed. One gentleman assured me of a fall of sixteen beats in the minute; and in another instance, I heard of twenty-five; but I am induced to believe that it is only *gradually and by slow degrees* that it effects a reduction of the pulse.

"You desire, doubtless, to know in what diseases this water is adequate to a *perfect cure*. I think in cases of *chronic inflammation* or *congestion of the mucous surfaces* of the throat, lungs, stomach, bowels, and genito-urinary organs.

"*Throat disease.*—I can report four or five cases cured. One, a gentleman aged sixty, with hectic flushes, bad cough, expectoration of viscid mucus, pulse often a hundred; remained four weeks at the springs,—entirely well.

"Second. A young gentleman who had a cough, emaciation, expectoration of viscid mucus, etc.; stayed a fortnight. I have seen him since,—quite well.

"A gentleman, from reading aloud, had cough, swelling of the throat in a slight degree, expectora-

tion, debility, etc.; duration of the disease, six or eight months; reports himself well. I might say the same of several others similarly affected.

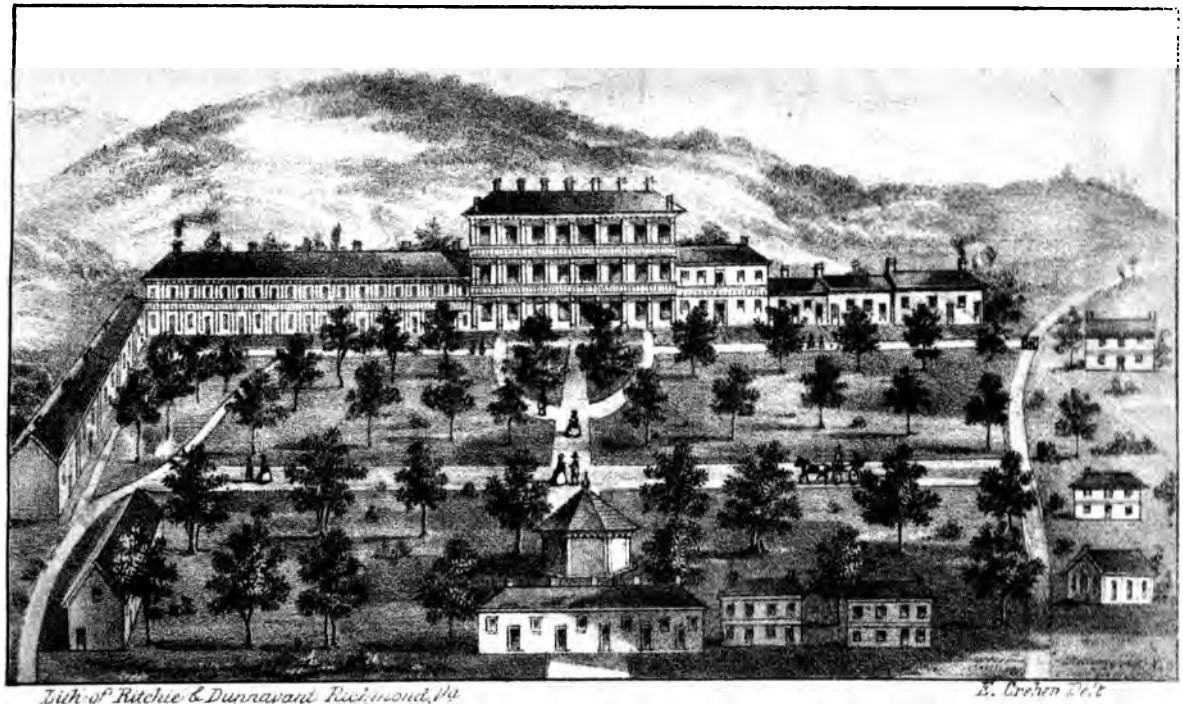
"*Bronchitis.*—A lady, duration of disease one year, cough, night-sweats, emaciation, loss of color and strength, congestion of the fauces, mucous *rales* slightly at the top of the left lung, no dullness, hæmorrhage slight and occasional; reported quite well.

"Another case.—Duration four years, occasional slight hæmorrhage, no dullness on percussion, scarcely any *rales*, vesicular murmur heard over the chest generally, palpitations of the heart, debility, diarrhœa, rapid pulse; reported much improved.

"Third case—A young gentleman of Philadelphia, from exposure to cold had a hæmorrhage, health remained bad, and was a source of uneasiness to his friends. He came to the Red Sulphur, remained awhile, and was much benefited; he has gained flesh and strength, and will return to spend this winter by way of protection against a relapse.

"I saw one case of chronic diarrhœa entirely cured.

"Two cases of vicarious hæmorrhage from the lungs: one very frequent and profuse, the other slight and occasional, (with derangement of stomach and bowels,) dependent, as I conceived, upon uterine derangement; one was cured, the other relieved."



BLUE SULPHUR · GREENBRIER, VA.

CHAPTER XI.

BLUE SULPHUR SPRING.

THIS spring is situated in Greenbrier County, thirteen miles from Lewisburg, twenty-three from the White Sulphur Springs, and thirty-two from the Red Sulphur, on the great thoroughfare leading to Guyandotte.

The knowledge of this spring dates far back into the early history of Western Virginia. It was first known as a *lick*, and being in the vicinity of the Sewel Mountains, attracted vast herds of buffalo and deer. It was soon, however, discovered to possess powerful sanative influences, producing extraordinary results in the cure of indolent ulcers and chronic diseases of the skin. It soon became a popular neighborhood resort for many of the sick and afflicted. The notoriety thus excited led to a scientific examination of its qualities, which resulted in a confirmation of its sanative power; and now it deservedly ranks high among the sulphuretted waters of our country.

The locality of the Blue Sulphur is within the geographical limits of the mineral fountains—both sulphuretted and thermal—of the mountains of Vir-

ginia, and enjoys to a full extent their balmy influence and the striking grandeur of their sublime scenery.

This watering place was improved by a Company living in this and the adjoining counties, with great attention to the comfort and convenience of their guests. The buildings consist of a large brick hotel, one hundred and eighty feet long and three stories high. From each side of this centre building are wings two stories high and one hundred and nine feet long, with piazzas running their entire length, and so constructed that the invalid needs in nowise suffer from any inclemency of the weather.

The fountain rises in the centre of an extensive and beautiful lawn, and is covered by a massive and well-devised temple. The spring, which is directly in front of the hotel, is inclosed in a handsome white marble box, five feet in diameter, the sides of which are coated with a pink deposit, imparting to its cool crystalline water a peculiar opalescent tinge. Nothing of the kind can be more beautiful or more inviting than this elegant pool of water. It flows off in a bold stream, and is soon received into pipes, and conducted away for bathing purposes.

The following is the quantitative analysis of this water, as made by Professor Rogers:—

Temperature variable, from 45° to 46°.

Solid matter procured by evaporation from one

hundred cubic inches, weighed, after being dried at 212°, 44·22 grains.

Quantity of each solid ingredient in one hundred cubic inches, estimated as free from water:—

	In 100 cub. inches.	In 231 cub. inches.
Sulph. lime	20·152 grains.	46·551 grains.
Sulph. magnesia	2·760 "	6·375 "
Sulph. soda	7·020 "	16·218 "
Carb. lime	2·185 "	5·047 "
Carb. magnesia	0·407 "	0·940 "
Chl. sodium	1·868 "	4·215 "
Chl. calcium	0·005 "	0·011 "
Protoxide iron, received from prot. sulph.	0·015 "	0·034 "
An azotized organic matter, blended with sulphur	3·000 "	6·930 "
	37·413 "	86·321 "

Earthy phosphates, a trace—iodine, a trace.

Volume of each of the gases in a free state:—

	In 100 cub. inches.	In 231 cub. inches.
Sulph. hydrogen	0·45 to 46 grains.	1·03 grains.
Nitrogen	3·25 "	7·49 "
Oxygen	0·56 "	1·29 "
Carb. acid	2·75 "	6·35 "
Total cubic inches	7·01 "	16·16 "

As a *therapeutic* agent, the Blue Sulphur deserves to occupy a high position among sulphuretted waters.

In *Chronic Hepatitis*, whether the deragement be

of tissue or secretion, it is a valuable remedy. In emulging and alterating the liver, and in relieving the skin of the icterode appearance attendant upon suppressed or vitiated secretions of the liver, it often displays very happy effects.

In Jaundice, and enlarged Spleen, it has been used with good results.

In diseases of the chylopoiëtic viscera generally, including dyspepsia in its various phases, it has been long prescribed with gratifying results.

In chronic irritations of the kidneys, bladder and prostate gland, it has been very usefully employed.

In *chronic diseases of the Skin*, particularly in that class of scaly disease, (order *squamæ*,) where the opaque and thickened *laminæ* of the cuticle are a product of inflammation in the true skin, as well as in the milder forms of *psoriasis*, Dr. Hunter informs me he has witnessed excellent effects from the water.

In *Amenorrhœa and Irregular Menstruation*, this water has long enjoyed a popular reputation, superior to most waters of its class, and from my own knowledge of its therapeutic powers, I award considerable confidence to it in such cases.

There is here an excellent *Bathing* establishment, consisting of *shower, warm and hot baths*, medicated and vapor, under the direction of Dr. Martin, whose long experience with them well qualifies him to judge of their remedial applicability.

CHAPTER XII.

SWEET SPRINGS.

THE Sweet Springs are situated in a charming valley in the eastern extremity of Monroe County. They are seventeen miles southeast from the White Sulphur, and twenty-two east from the Salt Sulphur.

These springs were discovered in 1764, before any of the other mineral waters in this section of the State were known. In 1774, they had attracted so much attention, as to be analyzed by Bishop Madison, then President of William and Mary College.

The beautiful valley, in which the spring is situated, is about five miles in length, and from one-half to three-fourths of a mile in width, and is bounded on the south by the lofty Sweet Spring Mountain, and on the north by the Alleghany. The spring and bath are situated in the lower end of a small hollow or valley, that makes out from the base of the Sweet Spring Mountain, from which the ground gradually swells on either side. Contiguous to the spring is a grove of a few old natives of the forest, that have fortunately escaped the axe of the spoiler, which, together with a fine sodding of grass, give the means of a pleasant promenade in good weather.

The earlier improvements of the place were of a rude but comfortable character; they have now, for the most part, given way to buildings of a high order of architectural merit, and attractive in every respect. The accommodations at present are ample for *six or seven hundred* persons, and it is the intention of the proprietor soon to enlarge them in the same style to double the existing capacity.

The *Bathing-house* is a large, tasteful, and elegant structure; and the separate reservoirs, for the use of ladies and gentlemen, are of ample size, and admirably arranged to give every comfort to the bathers.

The temperature (Bell) of the Sweet Spring is 73° Fah., the same as that which, in England, by a strange blunder, is called Bristol Hot Well. There is considerable resemblance between the two in other respects, as well in the evolution of carbonic acid, as in the earthy and saline matters held in solution. In the Virginia spring, however, iron has been detected; whereas the Bristol Hot Well has none in its composition.

By the analysis of Rowelle, one quart of the Sweet Spring water contains—

Saline substances in general	12 to 15 grains.
Earthy substances	18 to 24 "
Iron	½ to 1 grain.

The saline substances are sulphate of magnesia, muriate of soda, and muriate of lime, with a little

sulphate of lime. The earthy matter consists of sulphate of lime, a small portion of carbonate of magnesia and lime, with a small portion of silicious earth.

Professor William B. Rogers, late of the University of Virginia, in the course of his geological survey of the State, analyzed the waters of the Sweet Spring, with the following results:—

1st. Solid matter procured by evaporation from one hundred cubic inches, 32·67.

A portion of this is combined with water.

2d. Quantity of each solid ingredient, estimated as perfectly free from water, in one hundred cubic inches:—

Sulphate of lime	5·703
Sulphate of magnesia	4·067
Sulphate of soda	2·746
Carbonate of lime	13·013
Chloride of sodium	0·060
Chloride of magnesium	0·136
Chloride of calcium	0·065
Peroxide of iron (Sesquioxide)	0·061
Silica	0·075
Earthy phosphate	a trace.

3d. Volume of each of the gases contained in a free state in one hundred cubic inches of the water:—

Carbonic acid	37·17
Nitrogen	1·86
Oxygen	a trace.

Sulphuretted hydrogen, a trace, too small to be measured.

4th. Composition of one hundred cubic inches of the mixed gases rising in bubbles in the spring:—

Nitrogen	71·7
Carbonic acid	28·3

The chief distinguishing feature of this water is the predominance of the carbonic acid (fixed air) which it contains, and it is properly regarded as the best example of the acidulous waters that is found in our country.

*Few mineral waters have acquired such fashionable and well-merited celebrity as the Sweet Springs. The name is calculated to convey erroneous impressions of their taste, which is like a solution of a small quantity of a calcareous or magnesian carbonate. The excess of carbonic acid gives, however, the water a briskness, productive of a very different effect on the palate from what an imperfect mixture of the earths would produce.

The first effects of this water, due to its temperature and gaseous contents, when drunk, are a feeling of warmth at the stomach, with a sensation of fullness of the head, and some giddiness. Taken at stated intervals in moderate quantity, it will produce a moisture on the skin, and increase the flow of urine. If the stomach be in a good state, it gives additional appetite, and imparts fresh vigor to the system. Its

* Bell on Baths and Mineral Waters.

operations on the bowels vary at first; but, after a more protracted use, it will generally be found to increase a costive habit.

The Sweet Spring water is serviceable in the varieties of dyspepsia accompanied by gastrodynia or spasm, with pains occurring at irregular intervals, and heart-burn—where the extremities are cold and the skin torpid. In secondary debility of the digestive canal, from the exhausting heats of summer, or in chronic diarrhœa and dysentery, without fever, or not sustained by hepatic inflammation, much good will be produced by the internal use of these waters.

If much gastric irritation, or evident phlogosis of the liver be present, with a parched skin and other phenomena of fever, it will be better to premise one or two small bleedings, followed by the use of a blue pill at night, and a tumblerful or two of the water, to which has been added a teaspoonful of Epsom salts, or twice the quantity of calcined magnesia, early in the morning.

The harassing cough to which young persons are occasionally subject, and which often has its origin in an enfeebled state of the stomach, or in scrofulous habits from the enlargement of the bronchial glands—as also the *tussis humoralis* of old people—will all be materially benefited by the use of these waters. The relief afforded in such cases as these has usually given Bristol Hot Well its reputation in the cure of pulmonary consumption.

Females who have become enervated by long confinement, or from nursing their children, and whose constitutions have suffered for want of exercise and fresh air, will be greatly benefited by the use of these waters, internally and as a bath.

In subacute rheumatism, and in neuralgic attacks, the Sweet Spring bath is often eminently useful. In the closing stages of acute rheumatism, the patient is often harassed with a lingering irritability of his system, with tenderness, pain and inability in the diseased joints, sometimes attended with slight feverishness, especially toward the close of the day.

In such cases, while hot or warm bathing would be injurious, the baths of the Sweet or Red Sweet Springs may be resorted to with the best effects. The use of the *spout*, in such cases is valuable, by placing the diseased part under the falling water, and allowing it to receive the dash for a short time.

A very efficacious way of applying this water to the surface is by *douche*—the stream being directed to the part in which the disease is situated, wherever there is "augmented heat and fixed pain, as over the stomach, or liver, or abdomen generally, above the pubis, or on the loins and sacrum; also to the joints, when the violence of inflammation has not yet subsided, nor passed entirely into the chronic state. If the irritation of the stomach forbids the drinking of the water, *douching* the epigastrium would form a good preparative for its use in this way. *Lumbago*,

with some evening fever, *chlorosis*, or *fluor albus*, with heat and pain at the loins, would be benefited by douching this part.

"As we should have inferred from the excess of carbonic acid, and the presence of earthy carbonates in the water, it is useful in calculous and nephritic complaints."

The Sweet Spring waters, internally and externally employed, are adapted to a large circle of cases. As a tonic, in cases of pure debility, they may be used with great confidence—always, however, regarding this as an aphorism, that *they are contra-indicated, and should be withheld in all cases in which there is positive congestion in any of the vital organs.*

The first sensation on immersion in the Sweet Spring bath is a slight shock, which speedily passes off, leaving the bather with the most agreeable sensations while he disports himself in the sparkling pool.

The freedom and advantage with which this bath has been used by aged persons, is evidence of its general safety.

In using the bath, "the chief points to be attended to are, that the skin should not be moist or cold with perspiration, nor that there shall be general chill, nor the languor that follows excessive muscular action. The stomach also should be nearly empty, or at least not actively engaged in its work of diges-

tion." Many persons are injudicious in remaining too long in the bath. From two to ten minutes will embrace periods adapted to every condition, and only the most robust should remain in the last mentioned time. In a large majority of cases, indeed in all cases in which there is much general debility, from *two* to *five* minutes, according to circumstances, will embrace the proper periods for remaining in the bath. It is often advantageous te bathe twice or thrice a day, and this can be done safely in all cases, provided the patient does not remain too long in the water at any one time.

Dr. Woodville, who resides at the springs, in a communication he has been so kind as to address to me, remarks that the *therapeutic* action of "the water is that of a tonic, alterative, powerful diuretic, and occasional cathartic. From the union of so many purgative salts, we would naturally infer its cathartic action to be constant; this, however, is not always the case, as in frequent instances the opposite condition is the result."

As a *tonic*, he states that it is successfully used in chronic diseases connected with debility; as, for example, in certain forms of dyspepsia, amenorrhœa, chorea and hysteria; in chronic diarrhœa and dysentery, and in passive hæmorrhage. In dropsy, from its union of tonic and diuretic qualities, it is eminently useful.

In sterility, especially when connected with mem-

branous menstruation, it is looked upon almost as a specific. In those cases where the use of iron is peculiarly indicated it acts well. The amount of iron held in solution is not large, but in the action of mineral waters upon the animal economy, Dr. W. properly remarks, the effects are not proportionate to the quantity of any single ingredient. "In this matter, nature seems to be somewhat Homœopathic, and it may be, that the iron being held in perfect solution by means of an excess of carbonic acid, its full operation is obtained."

Dr. Woodville remarks, that in some forms of nephritic disease the water is highly beneficial, and in calculous affections, as we would naturally conclude, from an examination of its analysis, no mineral water could promise greater benefit. Observation, he remarks, has shown this to be the case in a remarkable degree, as many persons, who have been once relieved, are in the habit of returning annually to the springs to prevent a recurrence of their malady.

In cases of bilious derangement, Dr. W. considers that from its stimulating properties, it may often be used to advantage, and that, for persons enervated by a long residence in warm climates, no mineral water can produce happier results.

CHAPTER XIII.

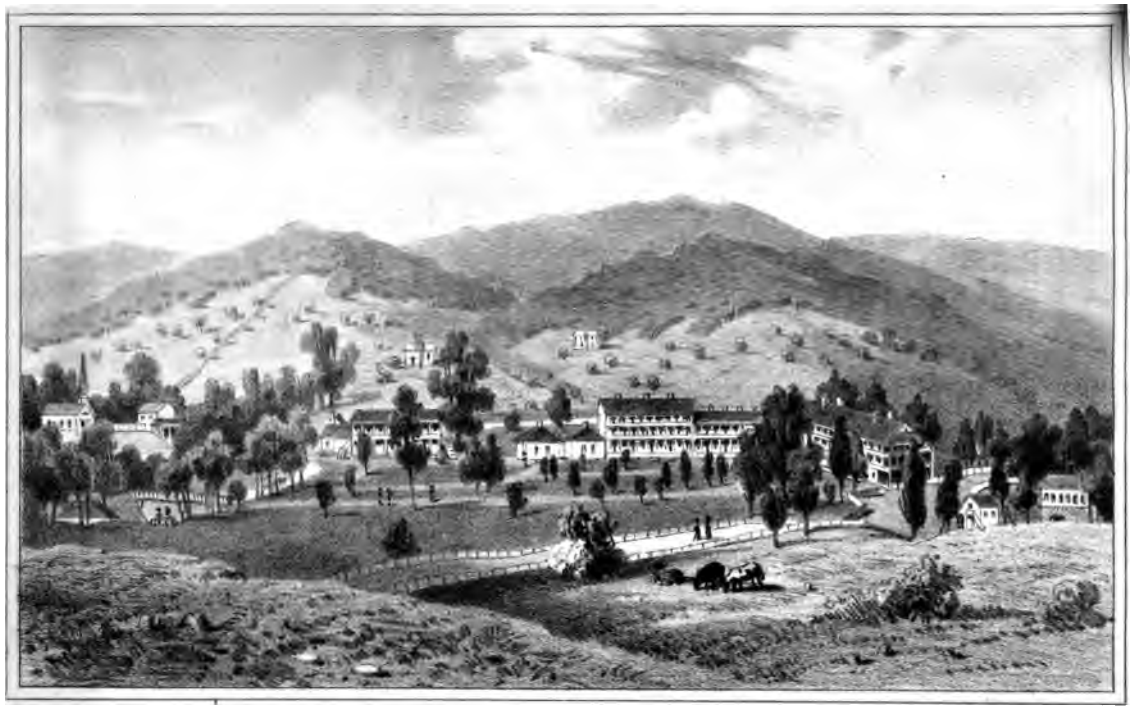
RED SWEET,—OR SWEET CHALYBEATE SPRING.

ONE mile north of the Sweet Springs, on the road leading to the White Sulphur, and just within the southern border of Alleghany County, are the *Red Sweet Springs.*

This property was originally owned and improved by Mr. Philip Rodgers, who for many years kept the old Sweet Springs. About the year 1845, it became the property of John R. Sampson, Esq., who occupied it for several years and still further improved it. It is now owned by Mr. C. Bias, formerly of Memphis, Tennessee, who occupies it and is devoting a large amount of energy to its further improvement.

This property, embracing about 1700 acres of land, affords one of the most productive farms in the State—a very great convenience to a spring establishment in reference to its supplies.

The improvements subservient to the springs are spacious, well designed and comfortable, and are sufficient for the accommodation of from three to four hundred persons. Among them, are well designed and spacious *bathing pools* for gentlemen and ladies, each affording à *douche*, from the use of which the bather may often derive most essential benefit.



P. S. Duval & Sons' Lith. Phila.

RED SWEET SPRINGS.

With other improvements to be brought into use the present year, are ladies' and gentlemen's bathing rooms fitted up for receiving *hot* or *warm baths* of any desired temperature.

There are two medicinal springs at this establishment, the one a few paces below the hotel, essentially the same, both in quality and temperature, with the old Sweet Springs; indeed, it may be regarded as identically the same water. The other, some forty rods, perhaps, above the hotel, is in many respects like it, but containing a much larger quantity of *iron*, which, being abundantly deposited in the form of a red precipitate, has given it the name of *Red Spring*.

The water of the Red Spring, which is the characteristic water of the place, and most relied upon both for drinking and bathing, issues from beneath heavy and irregular limestone arches, just at the head of a narrow cove formed by a projecting hill on one side, and on the other by large masses of porous stone, probably deposited there from the Sweet Spring water, which once flowed in this direction.

There are here three fountains, separated by narrow stone partitions, but all running into one common sluice. The upper and boldest of these fountains is about two degrees colder than the two lower ones, and evidently contains less of ferruginous matter. The water issuing from all of them, is probably two hundred and fifty gallons in a minute.

The water of the *Red Spring* has been twice

analyzed, first by Rowelle, and then by Professor Rogers.

According to Rowelle, *one quart* of this water contains—

Carbonate of lime	4 grains.
Carbonate of magnesia	8 "
Carbonate of iron	2 "
Silex	1 grain.
Sulphate of magnesia	1 "
Muriate of soda	½ "
Iron combined	1 "
Carbonic acid.	

The following is the result of an analysis by Professor Rogers of this water:—

1st. Solid matter procured by evaporation from one hundred cubic inches, weighed after being greatly dried at 112°, 40·76.

A portion of this is combined water.

2d. Quantity of each solid ingredient estimated as perfectly free from water. In one hundred cubic inches:—

Sulphate of lime	14·233
Sulphate of magnesia	8·107
Sulphate of soda	1·400
Carbonate of lime	1·166
Chloride of sodium	0·037
Chloride of magnesium	0·680
Chloride of calcium	0·010
Sesquioxide of iron	0·320
Organic matter in small quantities.	
Iodine, a mere trace.	

The iron is no doubt dissolved in the water as a carbonate.

3d. Volume of each of the gases contained in a free state, in one hundred cubic inches of the water:—

Carbonic acid	46·10 cubic inches
Nitrogen	2·57 "
Oxygen	·20 "

Sulphuretted hydrogen, a trace, too small to be measured.

4th. Composition of one hundred cubic inches of the mixed gases rising in bubbles in the spring:—

Nitrogen	62·5
Carbonic acid	37·5

The temperature of the Red Spring water, as it issues from three different heads, is from 75° to 79°. Frequent examinations of this spring with a thermometer induce me to believe that its temperature is slightly variable, never exceeding, however, one or two degrees of variation.

The analyses of the Red Sweet and Sweet Spring waters, by the same chemist, show that they contain essentially the same ingredients, but in different proportions, both the *salts* and the *gases* being more abundant in the former. The chief difference in the medicinal effect of the two waters is probably owing to the larger quantity of *iron* held in solution by the Red Sweet. While the Sweet Spring contains of iron 0·061 grs. in one hundred cubic inches of its water, the Red Sweet in the same amount of water contains

0·320, or about four-fifths in excess. This goes, so far as analysis can be satisfactory, to prove its higher tonic power. The iron in this water exists in the form of a carbonate, held in solution by carbonic acid gas, constituting the mildest, and, at the same time, the most efficient preparation of our ferruginous waters.

While the carbonic acid gas in the Red Sweet is 41·10 grs. against 37·17 in the Sweet, the carbonates as a whole largely prevail in the latter. Again, while the sulphate of lime is much the largest in the Red Sweet, the sulphates of magnesia and soda, both aperient in their character, decidedly predominate in the Sweet Spring waters. It may be noted that *iodine*, in small quantity, is found in the Red Sweet, and not in the Sweet; but its quantity is doubtless very small, and I am not aware of any peculiar effects of the water that can, with certainty, be attributed to this agent. It may, possibly, exert some beneficial influence as a tonic in combination with the other ingredients. From a review of the analyses of these two interesting waters, as well as from observation of their effects on disease, it would not be very inaccurate to say, that the Red is the Sweet Spring water with a strong iron base. But medical men, who should look closely into the peculiarities of remedial agents, will find upon careful scrutiny of these, that the difference in the amount and combination of their materials must modify, to some ex-

tent, their therapeutical agency upon the human system, and that, according to the practical object they wish to effect, they should select one or the other of them.

As a general rule, it is fallacious to adopt the analysis of a mineral water as a guide in its administration. Although an analysis, as correct as can be obtained in the present state of chemical science, is an important assistant in understanding the general nature of remedial waters, and in aiding in the formation of general conclusions in relation to them, still actual observation of the peculiar effects of these agents is greatly more satisfactory, and far more to be relied upon. Mineral waters often produce effects upon the animal economy that are not indicated by their analyses, and, in some cases, they produce results that are directly contra-indicated. But, in reference to these particular waters, there seems to be quite a concurrence between the indications afforded by their analyses and actual observation as to their effects.

With both of these lights before us, we are forced to regard the Red Spring water as being more decidedly tonic in its influences upon the system than the water of the Sweet Spring, and somewhat more exciting, too; hence, all the cautions, that have been urged in reference to the contra-indications of the use of the Sweet Spring water, apply even with more force as to the use of this.

From the same lights, we also learn that, as a very

gentle aperient, and a mild and somewhat *less exciting tonic*, the Sweet Springs have the preference, and especially in such cases as do not admit or require the use of chalybeates. The *diuretic* effect is about the same from the use of either water.

These general principles may, to some extent, I hope, indicate the class of cases that will be most benefited by one or the other of these springs. But it must be confessed that the subject is sometimes an intricate one, requiring a full knowledge of the case, with a careful comparative estimate of the powers of the two waters, to decide with certainty under the use of which the patient will be most benefited. There is, however, a large class of cases that will be essentially, if not equally benefited by the use of either of these waters. To such cases as require the use of the *iron tonics*, the Red Sweet water is peculiarly well adapted, and may be prescribed with great confidence.

Both internally, and as a bath, the Red Sweet waters are adapted to numerous diseases. As a *tonic* in cases of nervous debility, or of general prostration, the result of prior violent disease, they may be used with great confidence. In *dyspepsia, particularly when connected with gastrodynia*, and irregular pains in the stomach, with want of tone in the alimentary canal, they may be advantageously employed. In *Gastralgia*, or nervous dyspepsia, after the force of the disease has been softened down by the use of

medicines, or alterative mineral waters, they deserve the highest commendation.

Cases of chronic diarrhœa have been cured by the Red Sweet waters, after other springs, more commonly recommended for that disease, have failed to give relief.

Simple debility of the uterine, and urinary functions, is very generally benefited by these waters. *Spermatorrhœa*, and that peculiar nervous prostration connected with excessive or improper indulgences, are very happily treated by them, where regard is had to the state of the system in connection with their use. They are profitably prescribed in debility resulting from exhausting discharges, provided such discharges have left no seat of irritation to which general excitement may cause a rapid afflux of fluids with increased sensibility.

Ladies who are laboring under debility from long confinement or nursing,—those whose health has become impaired from want of exercise in the open air, as well as those who have been enervated by *leucorrhœa*, or other exhausting causes, will be greatly benefited by using the water and bath.

In *Neuralgic* affections, unattended with organic lesion or obstruction, this water is used with very general success, and rarely fails to ameliorate or cure such cases. The writer has great cause to speak favorably of this spring in neuralgia, not only from its success in a large number of patients for whom

he has advised its use, but especially in his own case. In the summer of 1842, he spent several weeks here, using the water internally and as a bath, for a sciatic *neuralgia*, under the painful effects of which he had been entirely prostrated for several months. To describe the great and almost instant relief which he derived, would demand the language of enthusiasm. For more than two months he had been unable to turn in his bed, and, during all this time, was under an agony of suffering which none but a neuralgic can comprehend.

Before using the water, he underwent a three weeks' course of preparation at the White Sulphur, which, while it did not relieve the pain, brought his general system into a favorable condition for the use of tonics. Unable to sit up, he was conveyed lying upon a bed in a carriage, to this place, and immediately entered upon the use of the water. The effects were as remarkable as they were prompt and happy. In a word, he here found a speedy and effectual remedy for this Protean and painful disease, after all other remedies had failed.

In speaking of the waters of the *Red Sweet* and *Sweet Springs*, I wish to be understood as alluding to the *baths*, as well as to the internal use of the waters. In a large majority of cases, the bath is, doubtless, the most prominent agent in effecting a cure. Merely *as a bath*, there is probably little difference in the effects of the two springs. The

temperature of the Red Sweet is two or three degrees warmer than the Sweet. This, in some cases, might be a difference of importance, and not to be overlooked by the physician or the invalid.

The effects experienced after coming out of these baths, provided the patient has not indulged himself in them too long, are as remarkable as they are agreeable. They differ widely from the effects of an ordinary cold bath. There is an elasticity and buoyancy of body and spirit that makes one feel like leaping walls or clearing ditches at a single bound. This cannot be from the absorption of any of the materials of the water by the cutaneous vessels. The few minutes that we remain in the water, especially the very short time after the stricture of the skin from the first plunge has passed off, forbid such an idea. May it not be owing to a stimulant impression imparted by the carbonic acid gas to the nerves of the skin, and by sympathy extended rapidly over the whole body?

CHAPTER XIV.

HOT SPRINGS.

THE Hot Springs are situated in the County of Bath, thirty-five miles northeast from the White Sulphur, and twenty-one west from Millborough Depot. Comfortable bathing-houses have been erected for the accommodation both of male and female patients. In each of these houses suitable arrangements are made for taking the *sweat* or *plunge* bath, as may be desired; or for receiving the *douche* when it may be required.

"There are six baths at this place," says Dr. Goode, "each supplied with water from a separate spring; they range in temperature from 100° to 106° of heat. The effects of these waters in disease prove that they are highly medicated, though they are considered by many as simple hot water. They are known to contain sulphate and carbonate of lime, sulphate of soda and magnesia, a minute portion of muriate of iron, carbonic acid gas, nitrogen gas, and a trace of sulphuretted hydrogen gas; and, when used internally, some of the consequences are such

as we might expect from our knowledge of their constituent parts.

"These waters, taken internally, are anti-acid, mildly aperient, and freely diuretic and diaphoretic. But, when used as a general bath, their effects are great, and excel all expectation. They equalize an unbalanced circulation, and thereby restore the different important parts of the system when torpid—that natural and peculiar sensibility, upon the existence of which their capacity to perform their several functions, and the beneficial action of all remedies, depend. They relax contracted tendons; excite the action of absorbent vessels; promote glandular secretion; exert a marked and salutary influence over the biliary and urinary systems, and often relieve, in a short time, excruciating pain, caused by palpable and long-standing disease in some vital organ."

These waters are suited *only* to chronic conditions of the system. Dr. James Johnson, of London, after enumerating the diseases in which Thermal Waters are *inadmissible*, adds, "But there is a long catalogue of chronic disorders, to which *thermal medicinal waters*, both internally and externally applied, prove extremely useful. Thermal waters act in three principal ways on the human machine: 1st, through the medium of *sensation*, on the nervous system; 2d, through the agency of their *temperature*, on the

vascular system; and 3d, by means of their chemical contents, on the secretory and excretory organs. In *most* chronic complaints, and especially in rheumatism, gout, cutaneous defedations, neuralgia, dyspepsia, glandular swellings, and visceral obstructions, there is pain, uneasiness or discomfort of some kind, which, indeed, constitutes the chief grievance of the individual. It is no unimportant matter to soothe those sufferings during the process employed for the cure. The warm bath effects this purpose in an eminent degree, through its agency on the sentient extremities of the nerves distributed over the surface of the body. There is an extensive chain of sympathies established between the skin and the internal viscera, and through the medium of this channel, agreeable sensations excited on the *exterior*, are very often communicated to the *central organs* and *structures* themselves. Even in this way, torpid secretions are frequently roused into activity and improved in quality, while the secretory apparatus itself is relieved from a *host of painful feelings*."

These waters have been analyzed by Professor William B. Rogers, formerly of the University of Virginia. The saline ingredients in one hundred cubic inches of water are—

Carbonate of lime	7·013
Carbonate of magnesia	1·324
Sulphate of lime	1·802

Sulphate of magnesia	1·530
Sulphate of soda	1·363
Choloride of sodium and magnesium, with a trace of chloride of calcium	0·105
Proto-carbonate of iron	0·096
Silica	0·045
	12·778

The free gas consists of nitrogen, oxygen, and carbonic acid gas. It also contains a mere trace of sulph. hydrogen.

The heat of the human body, as ascertained by inserting the bulb of a thermometer under the tongue, is about 96°—sometimes as high as 98°; and these degrees seem to be the same, with little variation, in all parts of the world, neither affected, in the healthy body, by the heat of the torrid nor the cold of the frigid zones. But this, however, relates only to the internal temperature of the body; the heat of the skin is very variable, and, generally, considerably below the degree of animal heat. This arises from the great cooling process of evaporation, constantly going on over the whole surface; its sensibility to all external impressions, and its exposure to the atmosphere, which seldom rises so high as 98°, even in the highest heats of summer.

From a view of these causes, we will easily be led to perceive why a bath heated to 98° gives a strong and decided sense of warmth to the skin; and a sensa-

tion of slight warmth, rather than of chilliness, is felt, even several degrees below this point.

Whenever a bath is raised above the degree of animal heat, it then becomes a *direct stimulus* to the whole system, rapidly accelerates the pulse, increases the force of the circulation, renders the skin red and susceptible, and the vessels full and turgid.

The temperature of the Hot Spring baths, ranging from 100° to 106°, must be decidedly *stimulant*, and the more or less so according to the particular bath employed. It is probably to their stimulant power that we are mainly indebted for their curative virtue. The soothing and tranquilizing effects, which often follow their use, are the result of their sanative influence in bringing the organism into a normal condition.

Hot baths are potent and positive agents. When applied to the human body they are never negative in their influences, but will do either much good or much harm, according to the judgment and skill with which they are employed.

Their stimulant influences forbid their use in all acute diseases, and they are contra-indicated in such chronic cases as are attended with high vascular excitement, or exalted nervous susceptibility. There are, nevertheless, a large number of *chronic* diseases in which hot bathing constitutes the most rational and the chief reliance of the invalid. But these potent agents should never be prescribed merely for

the *name* of a disease, however carefully its nomenclature has been selected. The precise *existing state of the system*, whatever may be the pathology of the disease, ought always to be carefully looked to before a course of hot bathing is directed.

These baths are found eminently useful in most cases of *chronic rheumatism*, and in the various forms of *gout*. In local *paralysis*, occasioned by the use of any of the mineral poisons, or in metastasis of gout, rheumatism, or other diseases, these baths may be used with good effect. *Chronic bronchitis*, especially if connected with a gouty diathesis; *deafness*, connected with defective or vitiated secretions of the membrane of the ear; old *sprains*, or other painful injuries of the joints, are often much benefited by the use of the baths.

Diseases of the Uterine System, such as amenorrhœa, painful dysmenorrhœa, etc., are often greatly relieved here.

In some of the more obstinate forms of *biliary* derangements these baths are used with happy effects; particularly the *hot douche*, when applied over the region of the liver to relieve the torpor of that organ.

There has already been so much written on the medical applicability of *thermal waters*, that I have not thought it necessary here to do more than to lay down a few general principles to guide the invalid in their use, and to allude to some particular diseases,

for the cure of which the Hot Springs are known to be well adapted.

The cause of the high temperature of thermal springs has long been a matter of curious speculation. Some have attributed it to the agency of electricity; but this must be regarded in the light of an ingenious speculation, rather than the result of observation and facts. It is very common now to regard phenomena as the result of electrical influences, principally, perhaps, because we know the agent to be very potent and pervading, but partly because of our ignorance of the general laws by which electricity is governed. But whatever the facts may be, there seems to be no proof approximating to a reasonable probability, that electricity is in any way concerned in producing the high temperature of thermal waters.

Another theory, and one which elicits the largest amount of credence, perhaps, from scientific men, alleges, that "the heat of thermal springs is owing to the central heat of the globe, and that it increases in proportion to the depth from which they proceed." The philosopher Laplace embraced this theory, and it is, I believe, held by most geologists. It is urged,* and, to some extent, is well maintained, that the "temperature of the earth increases, as we de-

* See Professor Daubeny's essay, in the Sixth Report of the British Association for the Advancement of Science.

scend into it, about one degree for every hundred feet; and if the increase continues in this proportion, we should arrive at boiling water at the depth of less than three miles." In proof of this fact, the regular increase of temperature, as workmen have descended into the earth in boring the *artesian* well at Paris, now eighteen hundred feet deep, and throwing out, by a subterranean power, an immense volume of warm water, might be cited. But what are we to do with the apparently refuting fact exhibited in the salt wells at Kanawha in our own State? Several of these wells have been bored to the depth of *sixteen* or *seventeen hundred feet*, and, as we are informed, without any appreciable increase of temperature.

Other theorists suppose that thermal springs owe their temperature to circumscribed volcanoes, and that such springs are a sort of safety-valve to those subterraneous conflagrations. It is well known that an earthquake, or an eruption of a volcano, has often produced a change in the temperature of thermal springs that were even at some distance from the place where these phenomena occurred.

There is still another theory, "that supposes that the heat of these springs is produced by certain processes going on in the interior of the earth, and that these processes are attended with an absorption of oxygen and a consequent extrication of caloric." In the absence of any positive knowledge on the sub-

ject, this theory would seem to be sustained by as much probability as any of the others that have been alluded to. But this is a subject that falls strictly within the province of geology; and the zeal and success with which that science is now being prosecuted, afford us reasonable grounds to look to its votaries for some elucidation of this curious topic.

CHAPTER XV.

WARM SPRINGS.

THE Warm Springs are situated in a narrow vale, at the western base of the Warm Spring Mountain, in the County of Bath, fifty miles west of Staunton, and five miles northeast from the Hot Springs. They are among the oldest of our watering places, having been resorted to on account of their medicinal virtues for more than eighty years. The property was patented by Governor Fauquier to the *Lewis* family, in 1760. For many years it was owned by the late Dr. John Brockenbrough, of Richmond, who devised it to his two interesting grand-daughters, also the grand-daughters of the distinguished Dr. Chapman, of Philadelphia.

Several of our medicinal fountains claim to have been known and appreciated by the aborigines of the country. In reference to this particular one, there are many tales related by that venerable class, the *oldest inhabitants*, of the discovery and use of its waters by the Indians.

It is a matter of sober history, that very soon after the discovery of the Warm Springs by civilized

man, they became celebrated for their curative qualities, in various diseases, as well as for the mere luxury of bathing; and that they were frequented, at much labor and fatigue, by great multitudes, before any other (save the Sweet Springs) of the valuable watering places in Virginia were known.

The waters of the Warm Springs have been analyzed by two distinguished chemists, and with such discrepancy in results as to afford indubitable evidence that an analysis is not to be implicitly relied on in the administration of mineral waters.

The following is the analysis made by Professor Wm. B. Rogers:—

"The large bath is an octagon thirty-eight feet in diameter; its area is 1163·77 feet. The ordinary depth being five feet, (it can be increased to six,) the cubic capacity is 5818·86 feet, or 43,533·32 gallons; notwithstanding the *leaks*, this quantity of water will flow into the reservoir in one hour. The average temperature of the bath is 98° Fah. The gas which rises in the bath consists of nitrogen, with minute quantities of sulphuretted hydrogen and carbonic acid.

"Besides this gas, each gallon of water contains 4·5 cubic inches of gas, consisting of—

Nitrogen	3·25	cubic inches.
Sulphuretted hydrogen	0·25	"
Carbonic acid	1·00	"

"The saline contents of one gallon of the water are as follows:—

Muriate of lime	3·968
Sulphate of magnesia, (Epsom salts,)	9·984
Carbonate of lime	4·288
Sulphate of lime	5·466
And a trace of soda	0·000
	23·706

The following is the analysis of the Warm Spring water by Mr. Hayes, of Roxbury, Massachusetts:*

"In physical characters, this water resembles ordinary chalybeate waters. Recently drawn, it is clear, colorless, and in some degree sparkling, when agitated. Its taste is styptic or ferruginous, leaving the impression of a large amount of mineral matter being present. Agitated in the atmosphere, it becomes turbid, and deposits in filaments an ochry matter, consisting of oxide of iron and organic matter.

"The dissolved gaseous matter is carbonic acid, with nitrogen; no oxygen is present. By heat it is rapidly changed, the deposit of ochry matter increasing in density, while gas is disengaged.

"A standard gallon of this water, weighed at 60° Fahrenheit, afforded the following proximate constituents:—

* Mineral Springs of Virginia.

1st bases:	Sulphuric acid	9·443 grains.
	Carbonic acid	9·210 "
	Silicic acid	0·990 "
	Organic acid	1·525 "
2d bases:	Potash	0·741 "
	Ammonia	0·110 "
	Lime	8·906 "
	Magnesia	0·444 "
	Protoxide of iron	0·973 "
	Alumina	0·290 "
		32·632 grains.

"The change produced in this water by exposure to the air, or by heating it, indicates that the protoxide of iron exists in the water, united with organic acid. When silver salts are mixed with the freshly drawn water, the decomposition which follows is not attended by the coloration which humic and apocrenic acids produce. The deposition, too, is largely mixed with oxide of iron. These, with other considerations, induce me to state that the protoxide of iron is united with crenic acid. In the further apportioning of the bases, by which we theoretically make up the salts supposed to exist formed in this water, the magnesia and alumina are combined with hydrous silicic acid, to form a compound soluble in carbonic acid and water. The remaining bases, then, constitute salts, which, through the influence of chemical affinities, are—

Sulphate of potash	1·371 grains.
Sulphate of ammonia	0·369 "
Sulphate of lime	14·531 "
Carbonate of lime	5·220 "
Crenate of iron	2·498 "
Silicate of magnesia and alumina	1·724 "
Carbonic acid	6·919 "
	32·632 grains.

"In the preliminary examination of this water, it was deemed remarkable that so small a weight of iron salt should impart so sensibly a chalybeate taste to so large a volume of water. Neither the carbonate nor sulphate of iron has this effect, and the only explanation is that alluded to above: the existence of a crenate dissolved in carbonic acid so as to form an acidulous water. This compound with the lime salts may be considered as the active medicinal parts of the water."

The virtues of this water are probably owing to its temperature, rather than to any medicinal agents combined with it. The supply of water is very abundant — estimated at six thousand gallons a minute. For the gentlemen's bath, it is received into a room thirty-eight feet in diameter, and may be raised to the depth of six feet. After it has been used, the water is drawn off and the bath fills again in fifteen or twenty minutes. The ladies' bath is comfortably-furnished, and when required the water may be raised to the depth of five feet. Adjoining

the gentlemen's bath, a room has been constructed for a cold *plunge* bath, which is plentifully supplied with common spring water, piped from the neighboring hills, of a temperature of from 60° to 65°.

The common practice in the use of the Warm Spring bath is, to bathe *twice* a day, and remain in the water from twelve to twenty minutes each time. In some cases, especially when the bath is used for cutaneous diseases, the patient may profitably remain in for a much longer period, even from half an hour to one hour. As a general rule, and especially for delicate persons, active exercise should be avoided while in the bath, and always, on coming out, the bather should be well rubbed over the whole body with a coarse cloth.

The best times for bathing are, in the morning before breakfast, and on an empty stomach an hour before dinner. Where perspiration is required, the bath should be taken in the evening, the patient retiring to bed immediately after.

The diseases for which these baths have been profitably employed are numerous; among them are atonic gout, chronic rheumatism, indolent swellings of the joints or lymphatic glands, paralysis, obstructions of the liver and spleen, old syphilitic and syphiloid diseases, chronic cutaneous diseases, nephritic and calculous disorders, amenorrhœa and dysmenorrhœa. Occasionally *chronic diarrhœa* is relieved. The same may be said of *neuralgia;* but, most gene-

rally, we find baths of somewhat lower temperature more beneficial in this disease. In connection with the internal use of the alum waters, these baths will be found very serviceable in the various and distressing forms of *scrofula*. In painful affections of the limbs, following a mercurial course, these baths are efficacious, and the more so if employed in connection with the internal use of the sulphur waters.

Some precautions should be observed in entering upon the use of these baths, even by those to whose diseases they may be well adapted. The bowels should be open, or in a solvent condition; the state of the tongue should indicate a good condition of the stomach; the patient should be free from febrile excitement, and from the weariness and exhaustion generally the result of traveling in the public conveyances, in hot weather. Many commit a great error, and occasionally make themselves quite ill, by imprudently plunging into the bath immediately after arriving at the springs, and before they have in any degree become relieved from the fatigue and excitation of the travel necessary to reach them. From such an imprudent course, the bather has little rational grounds to hope for benefit, and is fortunate if he escape without injury.

CHAPTER XVI.

HEALING SPRINGS.

THIS medicinal fountain is in Bath County, Virginia, and is one of the *thermal* springs that give name to that county, and for which the chain of valleys, that lie at the western base of the Warm Spring Mountain, is so remarkable. The most southern of the group is the "Falling Spring Valley," which embosoms the water under notice.*

Situated in the midst of a confined but fruitful valley, and surrounded by wild and romantic scenery, the Healing Springs afford a sequestered retreat for the invalid, and a pleasing resort for those who seek respite from the cares of business, or desire the refreshing influences of mountain scenery and climate.

This water, and something of its curative powers, were known at an early day; but owing to the want of means, and the existence of a bitter feud between the parties to whom it belonged, no improvement whatever was made; yet such has been its reputa-

* "A Notice of the Healing Springs of Bath County, Virginia, by William N. Patton, M.D."

tion, that every year a greater or less number of visitors, composed chiefly of extreme cases that had failed to be relieved elsewhere, or were too ill or too poor to go abroad, have resorted to it. Of late years, since it has become more the practice, in obstinate and long-standing complaints, to seek relief by the use of mineral waters, this spring has been steadily advancing in reputation, and, without improvements or other advantages, has now forced itself into public notice, and created a demand for extensive accommodations.

While a number of cases are reported to have been successfully submitted to the use of this water, no record of the character of such cases, nor history of their course and termination, has been made; nor do we know of any attempt to define the character of the water, to determine its mode of action, nor to designate the diseases which it is known to control.

To determine these points, a variety and number of facts have been gleaned from reliable sources, and furnish the data upon which the following conclusions are based.

Enough is known of the medicinal effects of this water to enable us to enrol it upon the list of known curative means, and to welcome it to a place among the medicinal fountains, for which this region is already so distinguished.

The Healing Springs comprise three separate springs. Two of these are quite near each other,

and the third at a distance of perhaps two hundred yards, in the same ravine. These springs are beautifully bright and crystalline; and the ever-bursting bubbles of gas, that escape with the water and float in myriads of vesicles upon its surface, impart to it a peculiar sparkling appearance.

The temperature of these springs is uniformly 84° Fah., nor are they subject to any variation of quantity or quality. Singly, they afford a considerable volume of water, and, together, would form quite a bold fountain. Each, it is thought by some, possesses properties and virtues peculiar to itself, and hence they have received distinctive titles; but, as the same sensible properties are common to them, perhaps no essential difference will be found in their qualities. The waters have not been analyzed. Lime and sandstone are the prevailing formations, and black slate, containing bisulphuret of iron, and other traces of minerals, are met with about the springs. From the superficial formations, however, it would hardly be legitimate to infer the character of this water, as it most probably has a very remote source, and derives chiefly its mineral elements from strata in the depths of the earth. The deposit along the stream is much more worthy of trust, and would seem to indicate the presence of lime, alumina, iron, and other salts; but, in the absence of any analysis, we forbear to determine, with even an approximation to certainty, the chemical character of the water.

A species of *algæ* springs up luxuriantly in these waters. It is of a dark-green color, and exceedingly delicate and beautiful in its structure. Its chemical nature has not been defined, though its therapeutical effects have been tested. Whether it acts by virtue of some inherent property of its own, or in consequence of principles imbibed from the water, or simply upon the principle of a poultice, or by combining all these, we will not attempt to decide. Charged with saline and gaseous matter, the baths at these springs are exceedingly buoyant and grateful, and perhaps unsurpassed for the delightful and refreshing sensation they communicate to the system. For drinking purposes, the water is too warm to be palatable at first, but its cordial effects upon the stomach soon make it an agreeable beverage. The water, when drunk, acts in three principal ways upon the system, to wit: upon the *kidneys*, the *bowels*, and *skin;* and perhaps the relative affinity for each particular organ is correctly indicated by the order of their enumeration. The direction to either viscus, is influenced somewhat by the condition of the system and by the manner of using the water. While it is capable of being directed to either organ specifically, it may be so employed as to exert a quiet and less marked, but not less salutary, effect over the whole at once. Its simultaneous action upon three great emunctories of the body, with its capacity to be directed specifically to either, constitutes this water a

safe and gentle, but at the same time a certain and efficient, depurating agent of the human body.

Acting upon the whole of the external surface, with its countless pores and innumerable sebaceous glands—stimulating to new action the entire track of the alimentary canal, with its numerous and important organs—and urging the kidneys to throw off the multiform materials designed to be separated from the circulating fluids, and producing, when retained or imperfectly eliminated, such dangerous disturbance to the constitution—it is not wonderful that the water should exercise control over diseased action, and prove a remedy for a wide range of human maladies.

The water is light, and does not oppress the stomach, however freely it is drunk. It is a ready promoter of digestion; and it is a common remark of those under its use, that they can eat with impunity what would otherwise be intolerable.

Bathing, both general and topical, is a valuable and important mode of employing the water, and should not be neglected when demanded by the circumstances of a given case.

The water of the Healing Springs, so far as it is capable of classification, may be regarded, in its general action upon the system, as *alterative and tonic*, both directly and indirectly; but inasmuch as it is an agent *sui generis* in its character, we doubt the correctness of limiting its action by restrictive definitions.

The first employment of these springs, and their earliest manifestation of curative powers, was in *ill-conditioned ulcers* and *intractable affections of the skin;* and hence the significant name they bear. In these diseases, as classes, often as annoying and unsightly as they are painful and intractable, this agent enjoys a high popular reputation.

In some cases of *inveterate* ULCERS, the water promises, by a painless process, to achieve what the surgeon's knife had been powerless to effect, or the more dreaded cautery had failed to accomplish. In *cutaneous diseases*, so frequently persisting for years, it is not less remarkable for its benign effects. In many of the graver forms of skin diseases, as well as in those of milder character, good results may be expected from its employment.

It is worthy of remark, that the grave consequences that sometimes result from healing long-standing ulcers and diseases of the skin by the ordinary methods, are less to be apprehended in the cases of cure by this water.

Scrofula is believed to be amenable to this agent. Recently, several cures of this malady are reported to have occurred under its use.

In *chronic ophthalmic affections*, whether dependent upon a scorbutic habit or other dyscrasy of the body, and in degenerate and morbid conditions of the eye, resulting from neglected or improper treatment, gratifying results may be anticipated from the judicious use of these springs.

Here, as in all the varieties of ulcers and local inflammations treated by this water, a new agent may be employed; it is the topical application of the moss that grows luxuriantly in the baths and streams that flow from them. This has a peculiar effect. When applied to a diseased surface, it becomes painful, sometimes exceedingly so, and yet, upon inspection of the part, its redness has been dispelled, and a new and more healthy action established. When the application has been long continued, the surface becomes blanched and corrugated.

In *subacute rheumatism* these waters have acquired considerable reputation. For the relief of the suffering, and to correct the morbid condition upon which it depends, they may often be employed, both externally and internally, with much benefit.

The temperature of the water is not so high as to stimulate this form into the *acute*, nor so low as to endanger the patient by sudden *metastasis;* while both effects are guarded against by its diuretic action, and its tendency to the bowels and skin. In the present instance, as in other cases, where it is desirable to give the water a decided direction to the bowels or skin, appropriate adjuvants should be employed.

In *Neuralgia*, a congener of the disease just considered, the water is frequently found to be remedial, and, from its alleviation of the thrilling, piercing pain attendant upon this affection, one of the springs

received, long since, the homely but expressive title of "Toothache Spring." It is to those cases, dependent upon general derangment of the system—resulting from a residence in unhealthy districts of country, or those that have their origin in nervous irritability, or spring from a gouty or rheumatic diathesis—that the water is adapted.

Dyspepsia, that inveterate scourge of the sedentary and thoughtful, which so often mocks all rational as well as foolish means that are invoked for its relief, not unfrequently finds an antidote in these waters.

For *chronic thrush* or *apthæ*, the Healing Springs have been employed with success, after a fruitless but persevering use of other means.

I have occasionally sent patients, suffering under *chronic affections of the lining coat of the bowels*, to this water, with good effect.

Leucorrhœa, and other kindred disorders of the female, when independent of malignant action, or actual displacement of organs, will often yield to the free internal and external use of the waters.

Some of the diseases of the urinary organs are favorably controlled by these waters; among which may be enumerated *chronic irritation*, with mucous discharges from the bladder. I have had occasion to be pleased with their effects in several such cases.

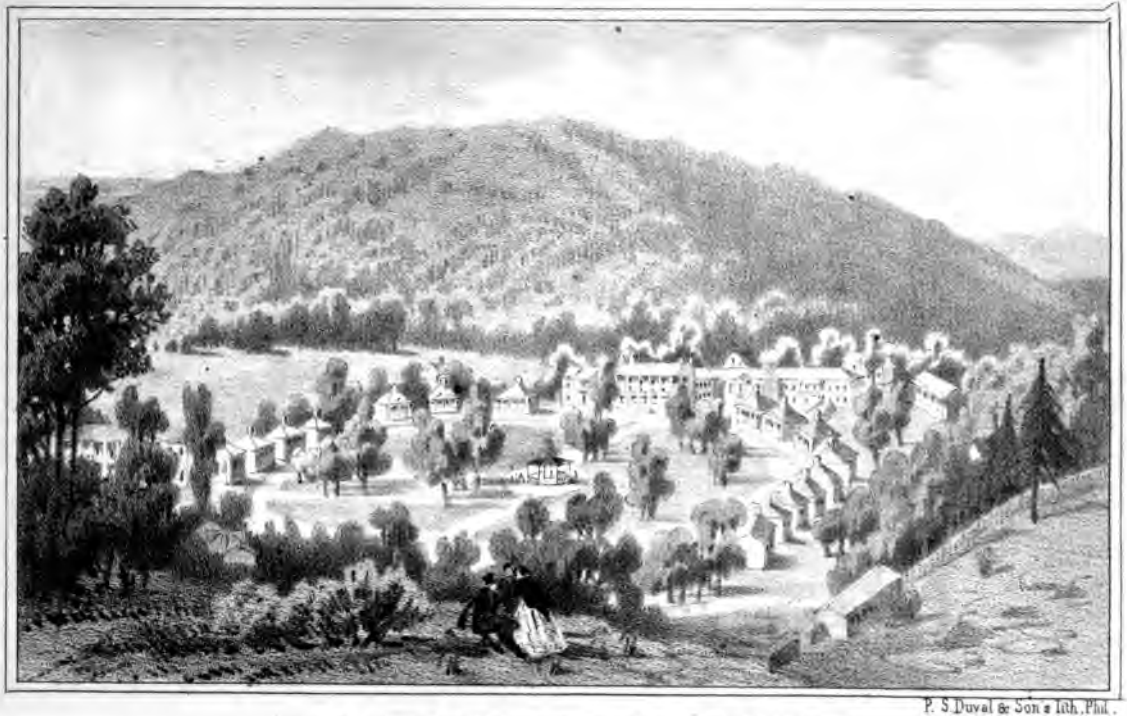
CHAPTER XVII.

ROCKBRIDGE ALUM SPRINGS.

THESE springs are siuuated in the northern part of the County of Rockbridge, on the main turnpike road leading from the town of Lexington to the Warm Springs, seventeen miles from the former and about twenty-one from the latter. They were originally the property of the Campbell family, by whom the land on which they are situated was *located* about sixty years ago.

The existence of an alum spring at this place was known at the time of the *entry* of the land, and its peculiarities soon led the people of the neighborhood to test its virtues, first as an external, and then as an internal, remedy, especially for diseases of the skin. The success of these experiments established a local reputation for the water to such an extent, that the proprietor of the springs found it to his interest to open a house of entertainment for the accommodation of those who might desire to use them.

But the isolated character of the place, the limited accommodations, and especially the fact that it was



P. S. Duval & Son's Lith. Phil.

then out of the great "Spring circle," and withal inconvenient to approach, prevented for several years any large visitation to the place. But the reputation of the water, resulting from actual experience in its use, continued to increase and extend, until the public demand for accommodation forced an enterprise into the economy of the establishment that has resulted in the erection of appropriate buildings sufficient for the accommodation of six or eight hundred visitors, and in greatly improving and beautifying the grounds adjacent to the springs. Still the increasing reputation of the waters, and a consequent increasing patronage, so urgently demand further accommodations that the proprietors are now actively engaged in the erection of new buildings to be finished by the next season, and which will still further increase their capacity to accommodate.

The property is now owned by Messrs. Frazier & Randolph, whose industry and enterprise give ample guarantee that the extent of their accommodations will hereafter be commensurate with the public demands.

Small reservoirs cut in the rock receive the alum water as it percolates through a heavy cliff of slate-stone. There are five of these reservoirs or springs, all differing slightly from each other, and also differing from themselves at different times, being stronger, and the water also more abundant, in rainy weather.

At the base of the same hill from which the alum

water issues, and a few hundred yards above, is a good *Chalybeate Spring*, which in many cases may be used either alone or in connection with the alum water, to great advantage.

These waters were analyzed by Prof. Aug. A. Hayes, of Boston, in 1852, with the following results:

Description and Analysis of three Samples of Rockbridge Alum Water from Virginia.

"The samples presented perfectly clear, colorless, and odorless water; the taste was very stringent, with the more lasting impression produced by iron salts. In closed vessels the water may be heated without becoming turbid, but boiling causes ochry matter to fall. In the composition of Rockbridge waters much more of the salts of alumina is found than in the Bath Alum water.

Rockbridge, No. 1.

A standard gallon at 60° F. contains—

Of bases:	Sodium and soda	0·250
	Potash	traces.
	Ammonia	0·471
	Lime	0·594
	Magnesia	0·368
	Alumina	4·420
	Protoxide of iron	1·748
Of acids:	Sulphuric acid	32·626
	Carbonic "	2·623
	Organic "	0·930
	Silicic "	2·460
	Chlorine "	0·257

The changes which take place in these waters by boiling, the action of sulphydric acid and salts of silver, indicate that these proximate constituents are combined to form the following salts:—

Sulphate of lime	1.439
Sulphate of magnesia	1·081
Protoxide of iron	3·683
Alumina	14·764
Chloride of sodium	0·423
Silicate of soda	2·544
Crenate of ammonia	1·401
Free sulphuric acid	18·789
" carbonic acid	2·623
	46·747
Pure water	58325·253
	58372·000

Sample of Rockbridge Alum, No. 2.

One gallon of this sample measured at 60° F. contains the following substances:—

As bases:	Potash	0·954
	Sodium	0·401
	Ammonia	0·300
	Lime	1·846
	Magnesia	0·600
	Protoxide of iron	2·304
	Alumina	5·360
As acids:	Sulphuric acid	34·219
	Carbonic "	7·356
	Crenic "	0·400
	Silicic "	2·840
	Chlorine "	0·607

The acids unite to the bases, forming salts of the following weights:—

Sulphate of potash	1·765
" lime	3·263
" magnesia	1·768
Protoxide of iron	4·863
Alumina	17·905
Crenate of ammonia	0·700
Chloride of sodium	1·008
Silicic acid	2·840
Free sulphuric acid	15·224
Carbonic acid	7·356
	56·687
Pure water	58315·313
	58372·000

Sample of Rockbridge Alum, No. 4.

One gallon of this sample afforded—

As bases:	Potash	traces.
	Sodium	0·173
	Ammonia	0·360
	Lime	1·346
	Magnesia	1·508
	Protoxide of iron	2·223
	Alumina	7·210
	Organic matter	1·020
Of acids:	Sulphuric acid	29·686
	Carbonic "	4·203
	Chlorine "	0·266
	Silicic "	1·710
	Crenic "	860

Those substances combined as salts give the following constituents:—

Chloride of sodium	0·439
Sulphate of lime	8·261
Sulphate of magnesia	4·418
Protoxide of iron	4·693
Alumina	24·085
Crenate of ammonia	1·220
Free sulphuric acid	5·511
" carbonic "	4·203
" silicic "	1·710
Organic matter	1·020
	50·560
	58321·440
	58372·000

In comparing these samples with those of the Bath Alum Springs, it will be seen that they are more highly acid in composition, and contain besides more of the tri-sulphate of alumina in a given volume. This salt gives character and activity to these waters, and renders them subjects of great interest when used as remedial agents.

Of the waters hitherto described, those from the Oak Orchard Acid Mineral Springs of Alabama, Genesee County, New York, approach most nearly to this composition.

The results of an analysis by Dr. James R. Chilton, of Spring No. 1, are given for comparison:—

Spring No. 1.

One gallon contains, of—

Free sulphuric acid	82·96
Sulphate of lime	39·60
Protoxide of iron	14·32
Alumina	9·68
Magnesia	8·28
Silica	1·04
Organic matter	3·28
	159·16

Containing nearly three times the weight of solid matter in the gallon, this water does not afford more than half the amount of tri-sulphate of alumina which is found in the average of the Rockbridge Alum Springs.

The supposed presence of arsenious acid, and the expectation that more active bodies than those named would be found, led to a careful examination of the black, decomposed shale from which the Bath Alum water takes its rise. The shale gave sulphates of iron, lime, and alumina to pure water, and contained an abundance of iron pyrites. When two pounds of the clay were decomposed, the resulting fluid contained no arsenious acid or copper. The earthy part afforded a trace merely of the phosphate of lime. The same negative results followed an analysis of the dry mass from four gallons of the mixed waters.

The general conclusions following from the results of these analyses are, that the Bath Alum Springs, containing more ferruginous salts, and having the sulphuric acid more equally neutralized, approach more nearly in composition to chalybeate waters. While the proportions of the salts to the pure water may vary, the relation in *kind* will be preserved.

The Rockbridge Alum waters, on the other hand, have their iron salts almost masked in their action by the predominance of free sulphuric acid and trisulphate of alumina. In these, too, we may expect the same general relation of *kind* to prevail, although more or less of the salts is present in the water. Both contain a portion of iron oxide, united to organic compounds, which, independently of the other salts and acids, would constitute them chalybeate waters. In their origin they are quite pure surface waters, which, percolating through strata undergoing decomposition, take from them their soluble mineral and organic matters."

Such is the analysis of this interesting mineral water, by the same distinguished chemist that analyzed the waters of the Bath Alum Springs.

The analyses of these two waters, so essentially resembling each other, are laid before the public in this volume, and by comparing them, an opportunity is afforded the medical man of hypothetically determining the character of each, and to see at one view

in what they agree, and in what they differ from each other; and hence, so far as analysis can settle the question, to determine their relative powers and medicinal applicability. Candor will have to admit, however, that it is not analysis alone, nor principally, that can satisfactorily determine the therapeutical character or medicinal adaptations of mineral waters.

Dr. Huntt, in his pamphlet on the Red Sulphur, in alluding to Professor Rogers's analysis of that spring, observes that "it certainly does not satisfactorily account for the wonderful effects of the water." The same remark may be made in reference to the analysis of all our mineral waters, in connection with the well known and peculiar operations of those waters, with the exception, perhaps, of the simple chalybeates; and this, it is fair to presume, will continue to be true of any analysis that can be made in the present state of chemical science. It is well known to every one at all acquainted with chemical science, that compounds of a very dissimilar character are produced by the combination of the same elements in different proportions, producing substances, in some instances, of far greater activity than any of the articles of which they are composed. There is, perhaps, no better illustration of this than that offered by the union of *oxygen* and *nitrogen*, producing, when combined in one proportion, *atmospheric* air, nitrous oxide in another, and *nitric acid* in a third. Nor are we sure that the

chemist is able to detect all the ingredients which mineral waters contain. The very *tests* which reveal some of them to us, may have the power of destroying others, and these, too, may be those in which the medicinal properties reside. The remedial properties, then, of mineral waters *cannot be determined with any certainty by analysis*, however nicely conducted, but must be ascertained by experience. One dozen well "*watched*" cases, under the use of a mineral water, will do more to determine the medical powers and applicability of such water than any analysis that can be made by the ablest chemist.

An analysis of a mineral water satisfies curiosity as to the materials the water is supposed to contain, while it enables the medical man to form some general conclusions as to the most prominent characteristics of the water as a remedial agent. Thus far, they are valuable, but singly and alone, without the aid of observation and experience, they never can be safely relied upon to guide in the administration of a remedial water in individual cases.

This position finds a pertinent illustration in the Rockbridge Alum water. Who would not say, looking at the analysis of this water alone, that its operation would be that of an *astringent* upon the system? while the fact is, that it *purges* seven out of ten that use it. Again, who would have judged, from a mere analysis of the water, that it was calculated to remove a great reproach from the healing art, by con-

stituting a reliable remedy for scrofula, a disease hitherto so entirely unmanageable? Yet, experience has established this fact beyond controversy.

Alum waters are of very recent introduction as remedial agents, and close practical observation is yet a *desideratum* as to their peculiar therapeutical agency and most appropriate medicinal applicability. These waters certainly possess unequivocal curative powers, and although their reputation is now high, they are destined to advance still further in public confidence. Experience has fully shown that they are very efficaciously used in many diseases of the skin and glandular system; and that in *scrofulous* affections they offer new hopes to the afflicted.

But the name *Alum*,* applied to this spring, while it is intended to conform to the general spring nomenclature of calling springs after some one of their leading ingredients, is, medically considered, a misnomer, and conveys the erroneous idea that its virtues are owing to the alum it holds in solution.

Chemically considered, it is an *aluminous sulphated chalybeate*, containing, as will be seen from its analysis, many of the best materials that are found in the most valued mineral waters in Europe, or this country. The protoxide of iron, sodium, potash, lime, magnesia, and ammonia, together with sulphuric, carbonic, crenic, chloric and silicic acids,

* See chapter i.

exist in the water in common with alum. Some of these ingredients are found in the most distinguished of the English and German waters, particularly in those of Tunbridge, Harrogate, Leamington, and Aix-la-Chapelle; as well as in the waters of the famous Spa, in Oarthe; in those of Passy, and in the celebrated springs of Bagneres, in Garonne, all of which have acquired a world-wide celebrity, for the cure of many diseases for which the Rockbridge Alum has been successfully prescribed.

The fact should always be borne in mind, by those who are investigating mineral waters, that it is rather to the *compound*, than to any single ingredient of a mineral water, that we are to look for its medicinal efficiency, and the scope of its applicability. That alum is an important ingredient in the compound of this water, I do not mean to question, but that it is so transcendently important as to give name to the spring, is very questionable. It is said that a rose by any other name will smell as sweet, and so will this *aluminous sulphated chalybeate* be just as efficacious under the appellation of Alum. But the real objection to the misnomer lies behind this, and exists in the fact, that it is calculated to mislead the uninitiated, in the absence of analysis, or careful inquiry. Indeed, I have reason to know that persons have not unfrequently been disinclined to visit the *Alum*, influenced by the name alone, and under the impression that the water, as its name imports, would

act as an astringent, and therefore be hurtful to them. How great is the error of such an opinion, every one who has been much at the springs is aware; for, so far from being astringent, the Rockbridge Alum will gently purge two-thirds of the cases submitted to its use.

But whether the name be, or be not, the best that could have been adopted, it is now a fixture, established by many years usage, and is not likely to be changed; and my only object in calling attention to the subject is to enter a caution against persons being misled as to the character of the water from the mere name of the spring.

These waters have been rapidly increasing in the public favor and confidence since they first became a resort for valetudinarians. They possess rare, but well-established medicinal virtues, and as their therapeutical applicability shall be more closely and distinctly defined, they must still further advance in popular and professional confidence.

The immediate effects of these waters, under their full and kindly influences upon the system, are those of a febrifuge tonic; resembling the action of some of our best vegetable medicines of that class; but superior to them, from their specific tendency to the bowels and kidneys.

By their diffusible astringent and tonic powers, they resolve the congestions of engorged viscera, and remove subacute inflammations; thus releasing and

giving activity to the fluids, they fill up the superficial capillaries and veins, and give a full, slow pulse, with a warm surface, and soft skin.

They purge mildly, perhaps, two-thirds of the persons that use them freely. Their action upon the *kidneys* is generally prompt, sure, and sometimes active. Their action upon the *skin* is secondary, and is the result of their sanative action upon the blood-vessels and internal organs, by resolving inflammation and congestions,—and hence, is always to be regarded as a favorable indication in the case.

Experience has fully shown that these waters are very efficaciously prescribed in many diseases of the *skin* and glandular system; *lupus* and other malignant ulcerations of the mouth and throat, have been cured by them.

In various chronic affections of the digestive organs, either simple, or implicating the liver, they are advantageously used.

They are very valuable in *mesenteric* affections, particularly in persons, old or young, of scorbutic tendencies.

In *chronic diarrhœa*, they display speedy and happy effects.

Being prompt and active as a diuretic, when judiciously used, they are found very beneficial in *chronic irritations*, and *debility* of the *kidney*, *bladder*, and *urethra*.

To several of the affections commonly known as *female diseases*, they are very happily adapted. In *leucorrhœa*, as would readily be inferred from their composition, they are an admirable remedy; often curing that disease, although it has been a complaint of long standing. In *menorrhagia*, unattended with plethora of the blood-vessels, and with the system in a condition to bear tonics, they may be prescribed with great confidence. In *amenorrhœa* and *dysmenorrhœa*, where a phlogosed state of the system does not contra-indicate the use of mineral tonics, they may be used to eminent advantage. In the *chlorotic* condition of the female system generally, and especially when the tendency is great to *paucity* or *poverty of blood*, the waters will be used to much advantage.

In *anœmic* conditions generally, and in cases of debility and loss of tone in the nervous system, they may be administered with much confidence.

Bronchitis, when in connection with a strumous diathesis, may be treated by these waters to great advantage; in such cases, it will be found to be one of our best remedies.

In *Gastralgia*, or nervous dyspepsia, they often act most kindly and effectively, by changing the action of the mucous membrane, and relieving it of its subacute irritation.

They actively promote the appetite, and invigorate the digestive powers.

But it is especially in *Scrofula*, that these waters have won their highest honors and established a reputation, not only among the best mineral waters of this country, but of the world. Their happy combination of tonic, alterative, diuretic and aperient qualities, render them an efficient remedy in many of the ills of humanity; but especially in the various forms of *strumous* disease, and even their worst forms, they merit confidence and deserve praise. In this formidable class of affections, whether exhibiting itself in the hardened and enlarged glands, and in ulcerations in children—in ophthalmic inflammations; in mesenteric indurations, or in its more intense and pervading development of adult life, they have been extensively used, and generally with great benefit to the sufferers.

Scrofula, or Kings Evil, has heretofore, to a large extent, stood as a reproach to the healing art; for although occasional remedies have claimed reputation for its cure, and often not without solid merit, it may well be doubted whether any has yet come into popular use, that is more generally successful than the Rockbridge Alum waters, when properly administered. This opinion of their high merit in such cases, is not the result of slight observations, or of their fortunate effects in one or two remarkable cases; on the contrary, it is the result of the knowledge of their employment for many years, in cases of various degrees of intensity, and in patients

of dissimilar ages and constitutions. The suffering of thousands, in whom the germ of scrofula is implanted, (or who are laboring under its developed evils, and who are not likely, as I believe, to obtain a more efficient remedy than is afforded by these waters,) will be esteemed a sufficient justification for the earnestness with which I indicate my confidence of their use in such cases. But let me not be misunderstood as intending to convey the impression that they will cure every case of this disease, whatever may be its seat, character, or combination; both my judgment and experience fall short of this conclusion; but they both concur in regarding the remedy as among the best, if not the very best, now known for scrofula, and one that is calculated to brighten the hopes of those who may be the subjects of this formidable malady.

The Rockbridge Alum, as therapeutic water, is not a negative agent; its effects upon the system are positive, direct, and palpable. It is, in a high sense of the term, a *medicinal water*, capable, when properly directed and applied, of doing great good in a wide circle of cases, or when injudiciously used, of disappointing hopes, and producing injury. It does not belong to that anomalous class of agents of which it is often said "they will do no harm if they do no good." Such being the potent character of these waters, the importance that cases, which are to be submitted to their use, should be carefully discrimi-

nated, and that the water should be employed under the direction of judgment and experience, must be apparent to all. It is a fortunate circumstance for the invalid public, as well as for the solid reputation of the springs, that several medical gentlemen of intelligence and acquirements, are in the habit of making their residence there during the watering seasons, whose experience has made them familiar with the powers and applicabilities of the water, and who are therefore qualified to direct the invalid in its proper use.

This water has become an extensive article of commerce, and is largely transported from the springs, both in wood and glass, to be used by persons at a distance, and is believed to contain all, or most, of its curative powers, after being thus transported.

The residuary salts of the water obtained by evaporation, are also a subject of transportation, and are frequently used in substitution, where the water cannot be procured. A piece of this residuum, or mass, of the size of a common pea, dissolved in a half-pint of common water, will make it of about the strength of the water at the spring. This mass, administered in the dose of from three to four grains, in aromatic syrup of rhubarb, and repeated thrice daily, has proved a valuable remedy in obstinate bowel complaints of children, produced from teething, when unattended with fever. In adult practice, it is sometimes beneficially used in the dose of

from five to fifteen grains, to strengthen and promote digestion.

The proprietors of this watering place have adopted the plan of keeping open their establishment for the use of invalids, during the *spring* and *fall* months, as well as during the summer.

This is an excellent arrangement, inasmuch as it affords to invalids the opportunity of using the waters fresh at the spring, unannoyed by the summer crowd. The strength of the water, and its medicinal action upon the system, will be found to be essentially the same during the spring, summer, and fall.

P. S. Duval & Sons Lith Phil

BATH ALUM, Bath. Virginia.

CHAPTER XVIII.

BATH ALUM SPRINGS.

THE Bath Alum Springs are situated near the eastern base of the Warm Spring Mountain, on the main stage-road leading from Staunton to the Warm Springs, forty-five miles west from the former, and five miles east from the latter place.

The valley, in which they arise, is an extensive cove, irregularly encircled by mountains, with an unproductive sandy soil, and affords indications of salubrity and healthfulness.

It is only within the last five years that these springs began to attract public attention as a mineral water; and it does not exceed eight years since the grounds near the springs, now so elegantly and tastefully improved, were a wild and primitive forest. This great change, by which the "desert was made to blossom as the rose," was brought about by the energy of the late lamented John W. Frazier, Esq., whose family still own a large interest in the property.

The improvements here are extensive, substantial, and convenient, affording comfortable and elegant accommodations for a large company.

The Alum waters issue from a slatestone cliff of twelve or fifteen feet high, and are received into small reservoirs, that have been excavated near each other in the rock. These different springs, or reservoirs, differ essentially from each other. One of them is a very strong chalybeate, with but little alum; another is a milder chalybeate, with more alumina; while the others are alum of different degrees of strength, but all containing an appreciable quantity of iron.

Prof. Hayes, of Boston, the same gentleman to whom we are indebted for the analysis of several of our mineral springs, has analyzed the waters of the Bath Alum, and renders the following results from his chemical investigations.

"A standard gallon (58·372 grs.) was the measure of each water used in the determination of the quantities of the substances found. The experiments necessary for ascertaining the presence or absence of other substances than those named, were made on much larger quantities, so as to render the chemical history more exact.

"The first sample, Bath Alum No. 1,* at the

* Referring to the lowest spring.

temperature of 60° F. one standard gallon of this water contains:

Of bases:	Soda	0·720
	Potash	traces.
	Ammonia	0·880
	Lime	1·570
	Magnesia	0·960
	Protoxide of iron	6·876
	Alumina	8·080
Of acids:	Sulphuric acid	24·750
	Carbonic "	4·140
	Silicic "	1·890
	Organic "	1·020
	Chlorine "	0·107

"When their proximate constituents are arranged, so as to represent, as nearly as it is possible, the compounds which experiments prove to exist in the water, the composition of the whole may be expressed as—

Pure water	58826·557
Free sulph. acid	5·806
Carbonic acid	4·140
Sulphate of lime	3·805
Sulphate of magnesia	2·821
Protoxide iron	14·516
Alumina	10·288
Chloride of sodium	0·176
Silicate of soda	2·024
Crenate of ammonia	1·850
Oxygen added to sodium	·017
	45·443

Sample No. 2, *Bath Alum* No. 3.

"In one gallon of this sample there were contained

As bases:	Potash	0·140
	Soda	0·350
	Ammonia	0·462
	Magnesia	0·486
	Lime	1·049
	Protoxide of iron	10·314
	Alumina	8·680
As acids:	Sulphuric acid	30·359
	Carbonic "	8·846
	Organic "	1·310
	Silicic "	2·800
	Chlorine "	trace.

"These substances united in the form of salts as existing in the water, give the matter foreign to pure water.

"The composition of the gallon in grains is—

Pure water	58317·206
Free sulphuric acid	7·878
Carbonic acid	8·846
Sulphate of potash	·258
Magnesia	1·282
Lime	2·539
Protoxide of iron	21·776
Alumina	12·293
Crenate of ammonia	1·776
Silicate of soda	8·150
	54·798
Pure water	58317·202
	58372·000

"This sample differs from the first in acting much more strongly on the organs of taste, and the quantity of free sulphuric acid is larger than in that water. Both these waters are highly acid in their action, although the acid is united to bases, which in part neutralize its power. When by boiling a deposit takes place, if the heat is continued, the deposited matter re-dissolves as the water evaporates.

"When much reduced in volume by evaporation, the excess of acid chars the organic acid present, and alters the composition of the salts.

"In considering the composition of these waters, the protoxide of iron is assumed to be united to the sulphuric acid. The change produced by heating is referred to the action of the crenate of ammonia, and is the same as ordinarily where crenates, free from apocrenates, are naturally contained in a water. When mixed with the soluble salts of silver and exposed to light, the gray color is entirely distinct from that produced by either apocrenates, humates or any decomposing matter. When the metallic silver and oxide of iron resulting from the first action are removed, the mixture by evaporation continues to afford brilliant scales of metallic silver, until reduced to a small volume.

"The gaseous matter in these waters is a mixture of carbonic acid, nitrogen, and a small proportion of oxygen, and the measure is about one volume of the mixed gases to forty volumes of the water. The

carbonic acid is given by weight, so that a uniform expression of acid relation is adopted, and no misconception can arise, if the reader bears in mind the fact that carbonic acid has more than twice the acid or neutralizing power possessed by the strongest fluid sulphuric acid."

Dr. Strother, an intelligent physician who long resided in the neighborhood, thought very favorably of them in *scrofulous, eruptive and dyspeptic affections.* He also bears testimony to their good effects, in *old hepatic derangements, chronic diarrhœa, chronic thrush, nervous debility*, and in various *uterine diseases*, especially in the worst forms of menorrhagia, and in *fluor albus*, both uterine and vaginal.

In *chlorotic* females, and in a broken-down condition of the nervous system, often in males the result of youthful improprieties, as well as when the system is *anæmic*, but free from obstinate visceral obstructions, this water promises to be very beneficial.

Its high chalybeate and aluminous impregnation manifests decided tonic and astringent powers, and indicates its adaptation to a number of diseases,—such as hæmorrhages of the passive character, the profluvia, obstinate cutaneous and ulcerative diseases, and anæmic conditions of the system generally, that are unattended with visceral obstructions.

CHAPTER XIX.

ROCKBRIDGE BATHS.

THIS new Virginia *Spa* is situated in the County of Rockbridge, on the stage-road from Lexington to the *Goshen Depot*, on the Central Railroad, and about equi-distant from the two places.

The waters of these baths are impregnated with iron, and abounds richly in carbonic acid gas. There are here two bold springs, furnishing sufficient water for two bathing establishments. The property is owned by a company of gentlemen residing in Rockbridge, who, in the course of the last two years, have erected handsome and convenient improvements, capable of accommodating from 150 to 200 visitors.

As a *tonic* bath, adapted to nervous diseases, general debility,—and to that comprehensive class of cases found to be so essentially benefited by tonic bathing,—and especially after the use of alterative mineral waters, these baths will be found highly efficacious, and are destined to be a favorite resort to a large class of invalids.

They are conveniently reached, either from Lexington or Goshen Depot, by stages running over well-graded roads.

CHAPTER XX.

DAGGAR'S SPRING, SOMETIMES CALLED DIBRELL'S.

DAGGAR'S SPRING is in the extreme northwestern portion of Botetourt County, thirty miles east of the great Alleghany chain of mountains, and just at the western base of the Garden Mountain, on the main road from Lynchburg to the White Sulphur, by way of the James River Canal. It is nineteen miles west, by a direct road, from the Natural Bridge, and twenty-eight miles from that place by the way of Buchanan, the route usually traveled.

The spring was first opened as a watering place some forty years ago, by a gentleman by the name of *Daggar*, and hence its name. Subsequently, it was owned by the late James W. Dibrell, Esq., of Richmond. The present proprietors are Messrs. Houston & Shields, gentlemen whose good cheer and kindly attention to their guests, make them very favorably known to the public.

The improvements here are neat, appropriate, and comfortable, and calculated for two hundred persons.

The company that assembles at this place has heretofore been largely composed of persons from

the towns and villages of the surrounding country, and from Eastern Virginia, constituting a most agreeable and sociable circle. Indeed, the place has long been remarkable for sociability, and there are few, if any, situations in our mountains where a period of relaxation from the cares and business of life can be more agreeably spent. Free and easy social intercourse, sanctioned and sustained by the polite courtesies of life, while it is delightful in itself, powerfully contributes to the relief of many ills that flesh is heir to. It well deserves to be taken into the account of the advantages accruing to the invalid at watering places, and cannot for a moment be overlooked by those who resort to such places for pleasure merely.

The spring, which arises at the termination of a pretty lawn in front of the hotel, and about two hundred yards distant from it, is a very bland and agreeable sulphur water, acting kindly as a *diuretic*, *aperient*, and gentle *alterative*. Holding in solution essentially the same medicinal ingredients, though probably not in as large amount, as distinguish our strongest sulphur waters, it may be used advantageously in the various diseases for which sulphur waters generally are employed. Being less exciting than many of them, and acting at the same time kindly on the various emunctories, it is better adapted to some cases, than the more potent waters.

Professor Rogers has examined this water chemically, but failed to make his analysis quantitative.

The *gaseous contents* are found to consist of—

Carbonic acid,	Oxygen,
Sulphuretted hydrogen,	Nitrogen.

The *solid contents* of—

Carbonate of magnesia,	Sulphate of soda,
Carbonate of soda,	Choride of sodium,
Peroxide of iron,	Silica dissolved.

He also found *organic matter*, containing *chloride of potassium, nitrogen, carbonate of iron*, and *carbonate of ammonia.*

Daggar's Springs are very valuable mineral waters. The character of the salts found to exist in them compares favorably with our first class sulphur waters. Their entire exemption from the sulphate and carbonate of lime, so commonly impregnating sulphur waters, while they hold in solution the carbonate, sulphate and chloride of sodium, with the chloride of potassium, is well worthy of note in estimating their value and peculiar adaptations.

Their composition, while it points them out as a bland and agreeable remedy for irritable conditions of the stomach and bowels, particularly indicates their adaptation to *gouty diathesis*, and for several forms of cystic and renal affections. Experience in the use of the waters has very satisfactorily shown, that in diseases of the kidneys and bladder, attended with discharges of sabulous concretions, (and, consequently, with a tendency to *calculus*,) they have

been employed with excellent success. The benefit derived in such cases, is due in part to their tendency to increase the flow of urine, thus affording an easier exit for the extraneous matter, and doubtless, in part, to their specific effects in alterating the fluids upon whose condition the morbid tendency depends.

In simple *Dyspepsia*, these waters are found eminently serviceable; and the same may be said of chronic affections of the abdominal viscera generally.

In derangements of the *biliary organs*, unattended with obstinate obstructions, they are used to great advantage.

The Daggar's Springs are waters upon the use of which the invalid, who desires gentle *aperient*, *diuretic* or *alterative* effects, may enter with much hope, and without that fear of over-stimulating the organs which demands a prompt and decided caution in the use of many sulphur waters.

Persons traveling from the South or Southwest, who wish to go to Daggar's, should leave the Virginia and Tennessee Railroad at Buford's Depot, thirty-seven miles west of Lynchburg. From that point, stages run over well-graded roads to Daggar's, a distance of twenty-eight miles.

From the White Sulphur, Sweet, and Red Sweet Springs, Daggar's are equi-distant, being about forty-three miles from either place.

CHAPTER XXI.

STRIBLING'S SPRINGS.

THIS watering place has been known and visited for more than thirty years. It derives its name from Erasmus Stribling, Esq., who first improved it in reference to its mineral properties.

These springs are in the County of Augusta, thirteen miles north of *Staunton*, from which they may be conveniently reached by stage-coaches.

For many years this place was valued mainly on account of its *Sulphur* and *Chalybeate* waters, but within the last few years an *Alum Spring* of much promise has been opened near the sulphur fountain, and the place now presents the three varieties of *Sulphur*, *Alum*, and *Chalybeate*, to the choice of the visitant.

The SULPHUR SPRING has been long known as a safe and valuable water of its kind, efficacious for the various diseases for which such waters are generally employed.

Professor Campbell, of Washington College, has analyzed this spring, and produces the following results from a *standard* gallon of the water:—

Carbonic acid gas.....	8·250 cubic in.	3·899	grains.
Sulph. hydrogen gas.....	2·470 "	0·912	"
Sulphate of potassa.....		0·441	"
" of soda.....		0·812	"
Chloride of sodium.....		0·610	"
Carbonate of soda.....		1·208	"
" of lime.....		5·517	"
" of magnesia.....		3·864	"
Phosphate of lime		0·002	"
Silicate of soda		0·253	"
Organic matter.....		1·229	"
		18·772	"

The ALUM SPRING has also been analyzed by Professor Campbell, with the following results from a standard gallon of the water:—

Sulphate of iron	12·125	grains.
Tersulphate of alumina.....	16·675	"
Sulphate of potassa.....	1·324	"
" of lime	6·877	"
" of magnesia.....	3·371	"
Chloride of sodium	0·640	"
Crenate of ammonia.....	0·630	"
Silica.....	1·550	"
Free sulphuric acid.....	9·092	"
Carbonic acid gas.....	3·575	"
	55·859	"

A comparison of this analysis with that of the Rockbridge Alum, shows a striking similarity, not only in the character of the ingredients contained in the two waters, but also in the relative proportion of such ingredients.

While this water holds in solution a larger amount of *sulphate of iron*, *magnesia*, and *lime*, it contains somewhat less of *alumina*, *potassa*, *sodium*, *silica*, and *ammonia*. The Rockbridge Alum, it will be seen, contains a greater weight of *sulphuric* and *carbonic acid gas*.

While both public and professional opinion of the value of this water is very favorable, there seems, nevertheless, not to have been any considerable amount of careful and practical observation of its peculiar therapeutic effects, in a large circle of cases. To ascertain the precise therapeutic agency and adaptation of a mineral water, it is a matter of the utmost importance that the pathological character of the cases submitted to its use should be accurately defined, and the effects of the water carefully noted; under such a system of observation, a mineral water will soon make out its own independent record, to the great advantage of the invalid public, and to its own solid reputation.

But in the absence of such actual observation of its effects, the essential similarity of this water to the Rockbridge waters, whose virtues and adaptations are now pretty well known, leaves no reasonable doubt of the great value of this spring; and indicates with a good deal of clearness its adaptations to the various forms of diseases so happily treated by the waters whose chemical composition it so much resembles.

Dr. Blair, who resides in the neighborhood of the spring, speaks favorably of its effects in *Scrofula*, *Chronic Diarrhœa*, diseases of the *Skin*, and in general debility. There can, we think, be no doubt of its useful employment in such cases.

Dr. C. R. Harris recommends it highly in cases in which *tonics* or *alteratives* are indicated; and Dr. J. L. Davis awards to it the credit of "relieving a *Gastro-enteritis* and *Chronic Dyspepsia*, in his own case, of fifteen years' standing."

Nature has been bountiful to Stribling's Springs, not only in the variety of their mineral waters, but in blessing them with a highly salubrious climate. Protected from the northern blasts by ranges of hills, delicate persons are well secured against the sudden vicissitudes of weather occurring early or late in the season, and may therefore visit them earlier in the spring, and remain later in the fall, than might be prudent in more exposed situations.

CHAPTER XXII.

RAWLEY'S SPRING.

RAWLEY'S SPRING is situated on the southern slope of the North Mountain, in the County of Rockingham, twelve miles northwest from Harrisonburg, and about one hundred and twenty miles northeast from the White Sulphur.

The Rawley water is a strong and pure *chalybeate*, and well adapted to cases requiring such a tonic.

The writer has had some personal experience in the use of this water, and for many years has been in the habit of occasionally directing its use in cases to which it is applicable. As a pure iron tonic, it deserves to stand at the very head of that class of remedies.

In that class of female affections *dependent upon debility, or want of tone in the uterine system*, the water is an exceedingly valuable remedy. Its salutary effects in cases of this description are often as remarkable as they are gratifying, restoring the functions of the debilitated organ, and imparting vigor and health to the whole system.

The Rawley waters are the strongest *chalybeate*

known to me; and if their great tonic virtues were more generally known, and especially their very superior efficacy in the class of *female derangements* just alluded to, they would be much and beneficially resorted to by those who frequent watering places.

In some forms of dyspepsia, and in nervous diseases with general debility and unattended with organic obstructions, these waters are used with great success. The same may be said of their employment in many cases of leucorrhœa and gleet, and especially in that peculiar form of nervous and mental debility, the frequent result of youthful improprieties.

The water of this spring has never been analyzed, but it is evident that the iron is held in solution in the form of a *carbonate*, which is the least irritating and the most efficient form in which it exists in mineral waters.

The accommodations at Rawley's are not extensive—sufficient, perhaps, for one hundred and fifty persons, and about that number may often be found there in the course of the season.

CHAPTER XXIII.

BURNER'S SPRINGS, OTHERWISE CALLED THE SEVEN FOUNTAINS.

ARE situated on the western base of the Massanutten Mountain, in the County of Shenandoah.

The position of these springs is elevated and salubrious, affording a pleasant and healthful resort for the invalid during the hot months of summer. The scenery around is picturesque and beautiful; and from the summits of the Fort, and Massanutten Mountains, that surround the springs, unsurpassed in its extent and rural loveliness.

In a bowl-like hollow, and within a circle whose radius does not exceed a few rods, rise the "*Seven Fountains*," not homogeneous, but differing in temperature and character from each other.

The central spring is a sulphur water, and within a few yards of it, are two others of the same general character, but differing somewhat in temperature and chemical composition. At a few paces distant are *freestone*, slate, and limestone springs, and very near, still another, called the *Willow Spring*, differing from all the others.

The temperature of the BLUE SULPHUR is 60° Fah., and its water is reported to contain in its *gaseous contents*, sulph. hydrogen and carb. acid; and in its *solid contents*, sulph. soda, sulph. magnesia, sulph. lime, carbonate magnesia, carbonate lime, chloride calcium, chloride sodium, and proto-sulph. iron, but in what relative proportions has not been ascertained.

The WHITE SULPHUR is reported to contain the same ingredients as the "*Blue*," with the addition of the *chloride of magnesia*, and the exception of the *proto-sulph. iron*.

Judging from the analysis before us, these two springs do not very essentially differ from each other.

The WILLOW SPRING, in its *gaseous contents*, contains *carbonic acid;* in its solids, carbonate soda, carbonate magnesia, carbonate lime, chloride sodium, alumina, and *organic* matter.

The CHALYBEATE SPRING is a carbonated water, in which is found carbonate of magnesia, lime, soda, and iron, with sulphates of soda and lime.

The various *Dyspeptic* depravities, functional derangements of the *abdominal viscera*, chronic diseases of the *Skin*, *Kidneys*, and *Bladder*, as well as *general debility*, with *nervous mobility*, will be advantageously treated by these waters.

These springs may be conveniently reached from *Woodstock*, eight miles distant.

CHAPTER XXIV.

JORDON'S WHITE SULPHUR SPRINGS.

THESE springs are in Frederick County, Virginia, five miles from the town of Winchester, and one and a half from Stephenson's Depot, a point on the Winchester and Harper's Ferry Railroad. They are situated in a small valley, surrounded by hills of no great altitude. The earth in the vicinity of the springs is blended with slate, very porous, and readily absorbs all the water that falls upon it. Hence, it is as remarkable for its dryness, as is the neighborhood for its exemption from vapors and fogs. The grounds about the springs are well covered with grass; are sufficiently extensive for pleasant promenades; and, withal, are shaded by a variety of ornamental trees, among which are found the aspen, willow, sycamore, ash, cedar, etc.

From several of the surrounding hills, pleasant views may be had of the Blue Ridge and Alleghany Mountains, and the immense gap at Harper's Ferry. One mile from the springs is a small and unique mountain, covered with stunted pine, and known by the somewhat unpleasant cognomen of the "Devil's

Back Bone." It is quite a "lion" in its way, and is often visited by the sojourners at "Jordon's." On the eastern side of this small and narrow mountain, and just at its base, flows the Opaquon Creek, affording good fishing privileges, while along its western base runs a small stream that winds its way through the spring lawn midway between the hotels.

The buildings for the entertainment of the public are very comfortable, and consist of two large brick hotels and a number of cabins, and are said to be sufficient for the accommodation of three hundred persons.

The *spring*, although not one of great boldness, affords in abundance a mild, pleasant sulphur water, of the temperature of 57° Fah., which is said not to be influenced either in quantity or temperature by wet or dry, hot or cold weather. Like all other sulphur waters, it is unpleasant at first to the palate of the uninitiated, but very soon it is not only tolerated, but actually preferred to common water.

The fountain is inclosed by marble slabs, and shaded by an octagon structure, supported by large pillars. Its situation is midway between the hotels, and very convenient to all the boarders.

These waters have never been analyzed, though it will probably be found, judging from the geological position of the fountain, as well as from the sensible properties of the water itself, to contain less *lime* than many of our sulphur waters, and, therefore,

more free from the harsh ingredients imparted by the sulphate and carbonate of that mineral; while it holds in solution the other components usually found in our sulphur waters. If this suggestion be correct, it points it out as peculiarly valuable in gravel and the various chronic diseases of the kidneys, bladder, and urethra.

Medicinally, the water acts as a diuretic and slight aperient. As an *alterative*, it is found to be valuable in the various forms of chronic disease in which sulphur waters are commonly beneficial. Among other diseases, *dyspepsia* and the various gastric derangements have derived much benefit from its use. The same may be said of *liver disease*, *hæmorrhoids*, *diseases of the skin*, and *rheumatism*, especially when it proceeds from the use of mercury. Several gentlemen have borne very decided testimony to the superior efficacy of these waters in *gout*, and their unirritating quality would seem to point them out as a valuable remedy in that disease.

Physicians of eminence, long familiar with the use of this water, speak in the highest terms of its efficacy in *Jaundice*, and in the *functional* derangements of the *abdominal viscera* generally. They extol it as a valuable remedy in the various *chronic* affections of the skin; in chronic irritation of the kidneys and bladder; in gleet, and especially in female suppressions, unattended with acute symptoms.

The bland but sure effect of these waters upon the

system, points them out as a valuable agent in a large class of diseases, and inspires belief as to their successful attainment to still greater public favor and confidence.

The situation of the spring and country around it, with the many facilities of approach, etc.; its nearness to the seaboard, and the daily *cars* and *mails*, make it a most desirable place of resort for health or retirement during the heat of summer. The surrounding country is healthy, and the soil well calculated for invalids, as it never remains long wet after rains.

CHAPTER XXV.

SHANNONDALE SPRINGS.

THE *Shannondale Springs* are in the County of Jefferson, and arise in a peninsula of the Shenandoah River, known as the "Horse Shoe." They are five and a half miles from Charlestown, the seat of justice for Jefferson County.

The springs are three in number, but one only is principally used. The temperature of the water is 55° Fah., as reported by Dr. De Butts.

The Shannondale water seems to have some approximation in its nature and effects to the celebrated Bedford water. It may properly be classed as a *saline chalybeate*, and may be used with good effects as a mild alterative tonic, in some forms of dyspepsia, nervous diseases, general debility unattended with severe organic derangements, chronic diseases of the mucous surfaces, such as gleet, leuchorrhœa, etc., and to that class of female diseases requiring the aid of mineral tonics.

The water acts generally as a *diuretic*, and very commonly has a mild aperient effect.

The late Dr. De Butts, of Baltimore, analyzed the Shannondale water in 1821.

One hundred grains of the solid contents of the water of the principal fountain, afforded the following results:—

Sulphate of lime	63	grains.
Carbonate of lime	10·5	"
Sulphate of magnesia	23·5	"
Muriate of magnesia	1	"
Muriate of soda	1	"
Sulphate of iron	0·8	"
Carbonate of iron	0·7	"

Gaseous contents: Sulph. hydrogen, quantity not ascertained; carbonic acid, quantity not ascertained.

The accommodations at Shannondale are not extensive, perhaps adapted to one hundred and forty or one hundred and fifty persons, but it is admittedly a very delightful place, and the scenery is unsurpassed for its varied beauty and grandeur, eliciting the admiration of all who behold it.

CHAPTER XXVI.

BATH OR BERKELEY SPRINGS.*

THE Berkeley Springs are situated in the town of Bath, Morgan County, Virginia, two miles and a half from Sir John's Depot, a point on the Baltimore and Ohio Railroad, one hundred and thirty miles west of Baltimore, and forty-nine miles east of Cumberland.

These springs were resorted to by invalids at a very early period, and had great celebrity throughout the Colonies. Hundreds annually flocked thither from all quarters, and traditional accounts of the accommodations and amusements of those primitive times are calculated to excite both the mirth and envy of the present age. Rude log huts, board and canvas tents, and even covered wagons, served as lodging-rooms, while every party brought its own substantial provisions of flour, meat, and bacon, depending for lighter articles of diet on the "Hill folk," or the success of their own foragers. A large

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I am indebted to D. H. Strother, Esq. for much of my information in relation to the Berkeley Springs, and particularly for the historical sketch of the place.

hollow scooped in the sand, surrounded by a screen of pine brush, was the only bathing-house; and this was used alternately by ladies and gentlemen. The time set apart for the ladies was announced by a blast on a long tin horn, at which signal all of the opposite sex retired to a prescribed distance, and woe to any unlucky wight who might be found within the magic circle.

The whole scene is said to have resembled a camp-meeting in appearance; but only in appearance. Here day and night passed in a round of eating and drinking, bathing, fiddling, dancing, and reveling. Gaming was carried to a great excess, and horse-racing was a daily amusement.

Such were the primitive accommodations at the first watering place that was opened in Virginia, and such the recreations and amusements of our fore-fathers, about the eventful period that ushered us as a nation into the world.

The importance of this property was appreciated by the country at a very early period, for in October, 1776, in the first year of the Commonwealth, we find the following in the statute book of Virginia:—

"Whereas it hath been represented to the General Assembly, that the laying off of fifty acres of land in lots and streets, for a town at the Warm Springs in the County of Berkeley, will be of great utility,

by encouraging the purchasers thereof to build convenient houses for accommodating numbers of infirm persons who frequent those springs yearly for the recovery of their health,—

"Be it therefore enacted by the General Assembly of the Commonwealth of Virginia, that fifty acres of land adjoining the said springs, being part of a larger tract of land, the property of the Right Honorable Thomas Lord Fairfax, or other person or persons holding the same by a grant or conveyance from him, be, and the same is hereby invested in Bryan Fairfax, Thomas Bryan Mastin, Warner Washington, Rev. Charles M. Thruston, Robert Rutherford, Thomas Rutherford, Alexander White, Philip Pendleton, Samuel Washington, William Ellzey, Van Swearengen, Thomas Hite, James Edmunson, James Nourse, gentlemen trustees, to be by them, or any seven of them, laid out into lots of one-quarter of an acre each, with convenient streets, which shall be, and the same are hereby established a town by the name of Bath," etc. etc. (*Hening's Statutes at Large.*)

The town was consequently laid off into lots in August, 1777. Among the purchasers were Charles Carroll, of Carrollton, Horatio Gates, Gen. George Washington, and many others of note and distinction.

In the schedule to Gen. Washington's will, we find the following clause:—

"BATH OR WARM SPRINGS.

"Two well-situated and handsome buildings, to the amount of £150."

And this note of the property appended to the schedule:—

"BATH.

"The lots in Bath (two adjoining) cost me, to the best of my recollection, between fifty and sixty pounds, twenty years ago. Whether property there has increased or decreased in value, and in what condition the houses are, I am ignorant; but suppose they are not valued too high."

The sites of these houses are still pointed out.

In the memoirs of the Baroness de Reidesil, (wife of the German general who was taken prisoner with Burgoyne at Saratoga,) she speaks of having passed part of the summer of 1779 at these springs with her invalid husband, and mentions having made the acquaintance of Gen. Washington's family. She devotes a page or two of her most interesting work to the narration of quaint and pleasant incidents illustrating their mode of life at the springs, and at the same time illustrating (though unintentionally) the excellent and amiable character of the authoress.

After the war of the Revolution, the accommoda-

tions at the springs were greatly improved and extended; but as the State progressed in population and prosperity, a host of other bathing places and mineral springs were discovered and improved. Saratoga at the North, and the White Sulphur at the South, began to rival Berkeley in the race for public favor, and from the superior spirit and enterprise shown in their improvement, soon distanced her. Her register of thousands was reduced to five or six hundred per annum, and her hotels and bath-houses seemed destined to decay. In 1844 a fire accomplished in one night what time was doing gradually; fourteen buildings and half the hotel accommodations were destroyed. Col. John Strother, lessee of this property, made immediate preparations for the erection of a large hotel on his own ground, and by the next season, (1845,) had a portion of it ready for occupancy, and the entire elegant and extensive establishment completed in 1848. The erection of this building, and the completion of the Baltimore and Ohio Railroad, have restored Berkeley to her former prosperity; and from twelve to fifteen hundred annually register there and enjoy the great luxury of her waters.

BATHS, ETC.

The water supplying the baths, issues by three large springs and a number of smaller ones, from

the foot of the Warm Spring Ridge, all within seventy or eighty yards of each other, forming a bold and beautiful stream, which, in its course down the valley, supplies several mills and factories, and empties into the Potomac opposite to Hancock, Maryland, six miles distant. The water of all these fountains is of the same character, light, sparkling and tasteless, its temperature ranging from 72° to 74° Fah. and remaining the same at all seasons.

The accommodations for bathing are most convenient, extensive, and elegant.

The *gentlemen's* bath-house, a substantial brick building, contains ten large bathing-rooms. The baths are of cement, twelve feet long, five feet wide, and four and a half deep, filled from a reservoir by a four-inch pipe, and containing about sixteen hundred gallons each. In addition to this, and for the use of gentlemen, there is a *swimming* bath, sixty feet long by twenty wide, and five feet deep, containing fifty thousand gallons. The superstructure is handsome and tasteful, eighty-two feet long, and contains fourteen dressing-rooms. The luxury of disporting in this ample and exhilarating pool can only be appreciated by those who have indulged in it.

The *ladies'* bath-house is an elegant structure on the opposite side of the grove, ninety feet long, which contains, in addition to nine private baths, a plunge bath thirty feet long by sixteen feet wide, four and a half feet deep, and floored with white marble.

There is also an establishment for shower, spout and artificial warm baths. The bathing area is surrounded by a beautiful grove several acres in extent and handsomely improved.

The *hotel accommodations* are extensive and well gotten up.

Strother's, the principal hotel at the place, is a large, elegant and well conducted establishment, adjoining the grove, and will comfortably accommodate about four hundred persons. It is built upon three sides of a quadrangle one hundred and sixty-eight feet front by one hundred and ninety-eight, the front building being four stories high, the wings respectively being two and three stories. The court-yard is tastefully ornamented with trees, flowers and shrubbery. Altogether, it constitutes one of the most extensive and comfortable establishments to be found at any of our places of fashionable resort.

O'Ferrall's hotel is conveniently situated, well kept, and will accommodate one hundred and fifty persons. Other accommodations for one hundred and fifty persons may be found at the place.

MEDICAL PROPERTIES.

Although these waters possess considerable medical virtues when taken internally, they have been most celebrated as a *bath;* their pleasant thermal temperature, in connection with other properties,

adapting them, as such, to a wide range of diseases. They have never been accurately analyzed, but the presence of purgative and diuretic salts have been ascertained, though the impregnation is not strong and the amount uncertain.

Internal Use.—This water is tasteless, insipid from its warmth, and so light in its character, that very large quantities may be taken on the stomach without producing oppression or uneasiness. Persons generally become fond of it after a time; and when cooled it is a delightful beverage. It is beneficial in several of the chronic and subacute disorders, such as derangements of the stomach, with impaired appetite and feeble digestion, unconnected with any considerable degree of organic disease. Its salutary effects in these cases would seem to depend upon the exceedingly light character of the waters and their gentle alkaline properties, neutralizing acidity and invigorating and soothing the viscera.

In the early stages of *calculous* diseases, attended with irritable bladder, their free use internally and externally is frequently of benefit.

External Use.—Externally used, these waters are beneficial in the whole class of *nervous disorders* that are disconnected with a full plethoric habit, extreme debility, or severe organic derangements.

In cases of relaxed habit and debility, where suf-

ficient power of reaction exists in the system, the tonic and bracing influences of plunges in this water will be very invigorating.

Persons suffering from a residence in a warm, low, and damp climate, and subject to nervous affections, will probably be much benefited by the use of the baths.

To the various chronic affections of the mucous membranes, especially leucorrhœa, gleet, etc., as well as to that peculiar form of bronchitis which depends upon a relaxed condition of the membranes, with general want of tone in the nervous system, the water and baths are said to be highly beneficial. The same may be said as to local paralytic affections, if unconnected with congestion of the brain, or cerebral tendencies.

In mildly *chronic*, or *subacute rheumatism*, the bath has long enjoyed a high reputation. Many intelligent persons who have long been familiar with its use, place the most entire reliance on it in this class of cases.

The salubrious climate in which the springs are located, the ease with which they are reached by the Baltimore and Ohio Railroad, the well-tested value of their baths in all cases in which baths of their temperature ought to be employed, together with the excellent accommodations at the place, must continue to make "Berkeley" a favorite resort of the spring-going public.

There are in the immediate vicinity of Berkeley several unimproved sulphur and chalybeate springs, that will probably, at some day or other, be places of importance. Among these, and as most prominent, may be mentioned

ORRICK'S SULPHUR SPRING,

Situated three and a half miles from Berkeley, on the Warm Spring Run, and near the road that leads to Hancock. It is a very pleasant water, of the temperature of about 58° Fah. It is now unimproved, but may, and some day probably will, be made a place of interest, and an important auxiliary to the Berkeley Springs.

CHAPTER XXVII.

CAPON SPRINGS.

At the western base of the North Mountain, in the County of Hampshire, seventeen miles east of Romney, and twenty-two northwest of Winchester, whence they may be reached by a well-graded but mountainous road, are the *Capon Springs*. They are situated in a narrow vale not far distant from the Capon River, and surrounded by a rugged and romantic mountain scenery, perhaps unsurpassed in *trossack* wildness by any in Virginia. The region is high and healthy, and the sources of amusement, (often of consequence to the invalid,) and especially those of trout and river fishing, together with the excitement of the mountain chase, are unsurpassed at any of our watering places.

The improvements at Capon are extensive, affording accommodation for about seven hundred and fifty persons.

The largest building to be found at any of our watering places except the White Sulphur, is here. It is an immense structure fronting two hundred and thirty-six feet by forty, and five stories high; with

a portico two hundred feet in length by sixteen in width. To this main building a wing is attached of one hundred and ninety-six feet in length by forty in width and five stories high. The dining-room extends the entire length of the front building, and will conveniently seat from nine hundred to one thousand persons. The *lodging* capacity of the house is said to be six hundred. This building is known as the "*Mountain House.*" Besides this large establishment, there are other hotels at the place capable of accommodating one hundred and fifty persons, perhaps.

The *bathing establishment* at Capon is well designed and handsome, affording twenty bathing-rooms for gentlemen, and seventeen for ladies, with comfortable parlors for the use of the bathers. The baths are made of brick, coated with hydraulic cement. Shower and douche baths, and artificial warm baths are also supplied.

The spring affords about one hundred gallons of water per minute. The temperature of the water as it flows from the fountain is 66° Fah.; in the reservoir that supplies the baths, about 64°.

The water is essentially tasteless and inodorous.

Except in its thermal character, it cannot be compared to any of the springs in our "great spring region." It more resembles the waters of the Berkeley than any of our other springs. As a bath and a beverage, it will, when properly directed,

be found very useful in a wide range of diseases, especially in idiopathic affections of the nervous system, dyspeptic depravities, chronic derangement of the mucous surfaces, etc. It has acquired some reputation, and I believe justly, as a remedy in gravel and other derangements of the urinary organs. It is a valuable water, and like its neighbor Berkeley, is destined to increase in favor with the spring-going public.

The Capon waters have been *analyzed* by Dr. Charles Carter, of Philadelphia, and their principal medicinal ingredients ascertained to be

Silicic acid,	Magnesia,
Soda,	Bromine,
Carbonic acid gas,	Iodine.

Professor William Gibson, of the University of Pennsylvania, in a letter to his son, gives the following interesting account of Capon Springs:—

"I have just returned from an excursion of ten days to the Capon Springs, situated upon a lofty spur of the Blue Ridge, in Hampshire County, Virginia. Although very familiar, as you well know, with all the celebrated watering places in the United States, and believing many of them to possess undoubted sanative powers in certain affections of the stomach and liver, I was hardly prepared to suppose that one, comparatively unknown to fame, and of

singular efficacy in many varieties of dyspeptic depravity so common in our country, should have escaped my observation. You will be surprised, therefore, when I tell you that, as far as I can judge from a short trial, I consider *Capon* equal, if not superior, to any mineral spring in America, as a remedy for dyspepsia and the debility and depression of spirits generally attendant upon that protean and eccentric malady.

"After drinking the water for a few hours, its *diuretic* properties become very evident; and from that moment the invalid begins to experience its beneficial results; for no matter how much he has been prostrated, his peccant humors are floated away through the medium of the kidneys, his spirits rise, his activity increases, and in a wonderfully small space of time he becomes a new man. The only inconvenience attending its use is an amazing increase of appetite; so much so, that the most feeble and delicate stomachs, after a few days, become boundless in their demands upon the good cheer of the obliging and enterprising landlord, Mr. Waddle; and mountains of wild mutton and venison, and pheasants and wild turkeys, and the finest vegetables, vanish before the multiplied attacks of quondam invalids, who before they left home would have sickened at the sight of an egg or a muffin. So insatiable does the thirst for this water become, that the healthiest persons crave it incessantly, and suffer

as much while in the sphere of its influence, as a tobacco chewer would if deprived of that fascinating weed. Not only does the water, when taken internally, prove eminently useful to almost every one, but externally applied, in the shape of cold or warm baths, its beneficial results in cases of gout, rheumatism, diseases of the skin, and several other affections, are beyond all question. It has, moreover, the singular property of cleansing the skin instantly without soap, of removing tar and other similar substances from the hands the moment it is applied. It operates most powerfully, too, upon horses, in a very short time after it is used, and brings away from those animals, without failure, incredible quantities of *botts*—a species of worm to which almost every animal of the kind is very prone, and from which a great number annually perish. When it is considered how difficult and almost impossible it is by other means to kill a bott—for when taken from the stomach of a horse and placed in the strongest nitric acid, they have been known to live for hours—does not this fact alone speak volumes in favor of this water? I am told, upon high authority, also, that it is equally useful in bringing away intestinal worms from children, after every other vermifuge has proved unavailing and nugatory.

"All the facts I have here stated have been verified again and again, and are as familiar to the

people of Hampshire and the adjoining counties, and are as susceptible of demonstration to all that visit these springs, as any proposition in Euclid. * * Capon is only twenty-three miles from Winchester, by one of the best turnpike and mountain roads in the United States. * * * Only reflect, that here is a country with the wildest and most picturesque scenery almost at our doors; a country filled with game of almost every description; * * the air balmy and exhilarating as that of the Youghogany glades, where the heat is never felt in the hottest summer, and where a blanket can always be found comfortable at night, and will never be required in the day.

"I have formed the acquaintance here of several most intelligent ladies and gentlemen, all of whom have derived the greatest possible benefit from the water. Gen. A., a distinguished officer of the United States army, visited Capon early in the season, almost a skeleton from dyspepsia. He returned home in two or three weeks, completely metamorphosed. He paid a second visit during my stay, and rode thirty miles on horseback, and felt, as he expressed himself to me, like one risen from the dead. My friend, Mr. C. S., a most respectable and intelligent citizen of Fairfax, I found at Capon, very miserable and very dyspeptic. In a few days I found him chasing the deer and pheasants and fishing for trout like a boy, and before I left he was the most suc-

cessful and energetic sportsman of the place. I could name many other instances within my observation. Upon myself the waters acted like magic. After ten days use of them, I felt as if I could 'ride on the whirlwind and direct the storm.' All this may seem exaggerated, or the effect of a heated imagination; but I assure you there is no poetry in the case, except what exists in the nature of the scenes which I have attempted to describe."

CHAPTER XXVIII.

COINER'S WHITE AND BLACK SULPHUR SPRINGS.

THESE springs are situated at the western base of the Blue Ridge Mountain, on the line between the Counties of Botetourt and Roanoke, on the borders of one of the most delightful and fertile regions of Virginia. They are immediately on the line of the Virginia and Tennessee Railroad, and within a mile of Bonsack's Depot, fifty miles west from Lynchburg.

These springs, as a public resort, are a product of the recent rapid spring development in Virginia, having been brought into public notice within the last four or five years. Fleming James, Esq., of Richmond, is the owner of the property, and has with extraordinary energy, and liberal appropriations to the object, improved them handsomely, and to an extent capable of entertaining from three to four hundred persons. The buildings are spacious, convenient, and almost entirely new, consisting of hotels, cottages, etc. etc.

We had some expectation of being furnished with an analysis of these springs before this volume went to press, and regret that it has not been supplied.

My personal observation of their effects in health and disease, is too limited to enable me to speak positively of their medicinal peculiarities or powers, and, in the absence of an analysis, prudence restricts me from considering their therapeutic character, except in the light of analogy, and from the experience of their use by a few gentlemen who seem to be well qualified to judge of their powers. From such light, I believe that these waters will be found a safe and beneficial remedy in a large class of cases usually successfully treated by the mild sulphur waters that exist in the same general geological region.

In cases of difficult, imperfect, or painful digestion, enfeebled condition of the nervous system, chronic diseases of the bladder or kidneys, salt rheum, tetters, indolent liver, with deficient or vitiated secretions, and to some of the affections peculiar to females, they will be found well adapted.

Coiner's Springs are convenient of approach either from the East or West, being only ten hours by rail, from Richmond or Petersburg, about two and a half from Lynchburg, and ten from Abingdon.

CHAPTER XXIX.

ROANOKE RED SULPHUR SPRING.

THIS is one of the new places of valetudinary and pleasure resorts which the recent ardor for spring improvement has brought to the public view.

It is situated in the County of Roanoke, on the stage-road from the town of Salem to the Sweet Springs, ten miles from the former, and about forty from the latter place.

The property is owned by a company of public-spirited gentlemen residing in Roanoke, who with commendable energy and taste, have within the last three years erected the buildings now there for the accommodation of the public—and who will doubtless continue to improve the property as the public demand may require. It is called *Red Sulphur* from the color of its deposits, and from its supposed resemblance, as a medicinal agent, to the old Red Sulphur in the County of Monroe.

The waters of this fountain have not been analyzed, nor have they as yet so far made out their medical record of applicabilities and cures, as to enable me to speak of them with such particularity as I could desire.

They are mild and pleasant sulphurous waters, and no doubt will be found well adapted to a numerous class of cases successfully treated by such waters. An intelligent and reliable friend, residing in the neighborhood, has assured me that they have been used with excellent effect in several cases of affections of the *chest* and *stomach*, and they are favorably spoken of by many persons who have visited them. From the known energy and enterprise of the proprietors of this fountain, we have reason to expect that they will not long delay to procure a correct analysis of its waters, nor fail in any other means calculated to do justice to this new and promising candidate for valetudinary favor.

These springs may be conveniently reached either from the Virginia and Tennessee Railroad at Salem, or from the Sweet Springs in Monroe, in stages, in both cases, running over well-graded roads.

CHAPTER XXX.

NEW RIVER WHITE SULPHUR.

Is the name given to a recently improved Sulphur Spring on New River, in the County of Giles, a few miles southwest from the Red Sulphur. This property has been improved within the last three or four years for the entertainment of visitors. The waters of this fountain have not been analyzed, but they belong to the great Sulphur class so abundantly found in that geological region, and doubtless will prove valuable in all such cases as are usually successfully treated by mild sulphur waters.

These springs may be reached by stage either from the Virginia and Tennessee Railroad at Newbern, or from the Red Sulphur Springs in the County of Monroe.

CHAPTER XXXI.

ALLEGHANY SPRINGS.

THE *Alleghany Springs* are situated on the south fork of Roanoke River, in the County of Montgomery, three and a half miles south of the Virginia and Tennessee Railroad at *Shawsville*, whence they may be conveniently reached by stage-coaches which run between the two points. They are eighteen miles southwest from the town of Salem, and ten miles east from Christiansburg.

The property was improved by the Messrs. Holts, and in part, is still owned by them. At present they furnish comfortable accommodations for two or three hundred visitors.

Although the Alleghany Springs have been long esteemed valuable by persons in their immediate neighborhood, it is only within the last five or six years, that they have attracted much general attention.

The waters have not been analyzed. They are regarded, however, and I have no doubt correctly, as belonging distinctly to the *saline* class, and to abound especially in sulphate of magnesia. They are *ca-*

thartic, diuretic, and tonic in their influences, and many patients, together with several judicious physicians who have tested their virtues, regard them as very valuable medicinal agents in various diseases affecting the stomach and chylopoëtic viscera.

Assuming that the general opinion which concedes to them distinct, and strong *saline quality*, is correct, we have but little difficulty in assigning to them a sphere of important usefulness.

The *saline* are among the most ancient of the various classes of mineral waters that were used for the cure of disease; and the general range of their applicability may be considered as pretty well defined.

Such waters exert but an inconsiderable effect upon the sanguiferous and nervous systems; their efficacy mainly depending on their laxative and purgative operations, by which the alimentary canal is excited to copious secretions, and the secretory functions of the *liver* and *pancreas* are stimulated to pour out their appropriate fluids; besides, like other mineral waters, they are absorbed, and conveyed through the whole course of the circulation, and are applied in their medical efficacy to the capillary tissues, and glandular organs. The sympathy between the digestive canal, upon which they operate primarily, and all the other organs of the body, prepares us for witnessing the happy effects which they

often exert upon the latter organs, by their direct effects upon the former.

Where no considerable irritation or inflammation exists in the mucous membrane of the stomach and bowels, *saline mineral waters* will be found valuable in relieving congestion or irritation of distant organs; *first*, by copious evacuation of fluids; and *second*, by derivation of blood from them to the superficies of the portal system.* Affections of the head, chest, skin and joints, will often be greatly benefited by their prudent use.

From the absorption of saline matters, contained in such waters, and possibly from the force of sympathy from other organs, the secretions of the *kidneys* and *skin* are commonly much increased. Such results, often highly beneficial, generally ensue from doses falling short of the quantity usually taken to produce active purging.

The waters of the Alleghany Springs, like all waters of the saline class, purge mildly or actively, in proportion to the quantity drunk and the peristaltic excitability of the bowels. Simply as a purgative, they are very superior in many chronic diseases to the drugs ordinarily used for this purpose, and principally in this, that the invalid can keep up their action upon the bowels for a number of days, without suffering that debility of the constitution and loss

* Bell.

of appetite which so constantly occur from a similar course of the ordinary purging drugs.

In small and *aperient* doses, they often act most beneficially on the functions of the *skin* and *kidneys;* and especially, if the warm bath, and gentle exercise, be connected with their use. Administered in the same way, we sometimes witness very pleasant influences from these waters upon the mucous surfaces, as well as upon the serous, synovial, and fibrous membranes; such results are sometimes witnessed in chronic catarrh, rheumatic affections of the joints, etc.

My experience in the use of the saline waters has been very favorable to their employment in *dyspepsia* as well as in many other of the derangements of the digestive and assimilative functions; in obstructions of the abdominal viscera generally, when unconnected with serious organic disease, they may be looked to as potent agents, and especially in cases attended with costiveness and depraved or vitiated biliary secretions.

The Alleghany Springs may be very conveniently reached from the East or South by railroad, by way of Lynchburg; or from the Southwest, by way of Knoxville.

CHAPTER XXXII.

MONTGOMERY WHITE SULPHUR.

THE MONTGOMERY WHITE SULPHUR are springs of recent discovery and improvement. They are situated on the southern slope of the Alleghany Mountain, in the County of Montgomery, a few miles east of the town of Christiansburg, and at a short distance from the Virginia and Tennessee Railroad, from which to the springs, a branch railroad has been constructed by the owners of the springs.

Persons visiting this place, leave the Virginia and Tennessee Railroad at the *Spring Depot*, on the slope of the Alleghany, and take the company's railroad, on which, in a few minutes, they are conducted to their destination.

The property is owned by a company of gentlemen, whose spirit and good taste in its rapid improvement, is deserving of public commendation. The buildings for the accommodation of visitors, that have gone up here in the last four years, and with a rapidity almost unprecedented in this country, are spacious, elegant, and convenient; and since their

construction have been well filled by visitors during the summer months.

The Montgomery White Sulphur is convenient of access by railroad, either from Lynchburg, a distance of about ninety miles; or from the Southwest by way of the Virginia and Tennessee, and the Tennessee and Virginia Railroads. The altitude of its position, and its health-inspiring climate, give to it potent recommendations for summer residence.

As yet no analysis of the waters have been made public, and they have been used medicinally for so short a time, that no record has been made of their powers and adaptations, sufficiently specific and distinct, to serve as a guide to the invalid, in their medicinal employment. As they are very favorably located for climate and general healthfulness, are easy of approach, and withal, are kept in a style of elegance and comfort, it is much to be hoped that the proprietors will add to their other commendable enterprises, that of furnishing the public with a correct analysis of the waters; and that such observations of their general and peculiar effects upon the various diseases submitted to their use, will be made by scientific and competent persons, as will enable the public to give them a definite and distinct *therapeutic* position among our numerous mineral fountains.

The waters of the Montgomery White being distinctly *sulphurous* in their character, and withal a

bland and pleasant beverage, will be found to be well adapted to the cure of a large number of chronic affections that are known to be advantageously treated by sulphur waters generally. They are somewhat less cathartic, and also less stimulant, than many sulphur waters, and hence may be used with more freedom and with greater safety than such waters, by delicate and excitable persons. This mild and slightly-operative character of the water, while it constitutes it a safe beverage for the delicate invalid, very happily adapts it, as a mild alterative and depurative agent, to a large class of cases in which alterative effects are demanded for the cure of the case.

The Montgomery White Sulphur occupies a central position among the Southwestern springs, having the *Alleghany*, and *Coiner's*—the one ten, the other thirty miles to the east; the "*Yellow*," and the *Pulaski Alum*—the first five, the latter thirty-five miles to the southwest; while the *Grayson Sulphur* is about sixty-five miles in the same general direction, all convenient of access from this point, by railroad and stage-coaches.

CHAPTER XXXIII.

YELLOW SPRINGS.

THESE springs are pleasantly situated in an elevated and picturesque part of the County of Montgomery, and are surrounded by variegated and interesting scenery, and a productive and prosperous agricultural country. They are about four miles from the Virginia and Tennessee Railroad, with which they are connected at Christiansburg Depot, by a well-graded turnpike. They are five miles distant from the *Montgomery* White Sulphur Springs, thirteen from the Alleghany, thirty-five from the *Salt Sulphur*, and about sixty from the *Greenbrier* White Sulphur.

The spring rises on the east side of the Alleghany, and not more than sixty feet below the summit level of that mountain; its waters flow into the North fork of the Roanoke, which is about two miles distant. In consequence of the great altitude of the spring, the climate in which it is situated is very salubrious, the air being elastic, pure and invigorating during the hottest days of summer. The water is clear, unusually transparent, and very cool; its tempera-

ture being about 55° Fahrenheit. Its taste is slightly astringent, or styptic. The taste or smell of sulphur is slightly, if at all perceptible, and so little unpalatable is the water, that many persons, after using it for a short time, prefer it to the common limestone water of the neighborhood. In running over rough channels, as well as on the bottom, and sides of the spring inclosure, it deposits a brownish-yellow sediment; a bluish sediment is also occasionally observed, supposed to be a prussiate of iron. After standing in an open vessel for some twelve or fifteen hours, it loses its styptic taste, becomes flat, and deposits a small quantity of its characteristic sediment. For cooking purposes, it is said to be prefered, if used as soon as it begins to boil, but if the boiling be continued, it renders whatever may be cooked in it bitter and disagreeable.

The improvements at the Yellow Springs are very comfortable; the buildings are *new*, pleasantly arranged, and combine elegance with convenience. Many of the rooms, as well as the spring and the pleasure grounds, are delightfully shaded by magnificent forest trees.

Under the name of "Taylor's Springs," or "Yellow Springs," this watering place has been well known and much visited by invalids, for near sixty years. As early as 1810 it attracted considerable attention, and had numerous visitors, especially from Eastern Virginia, and North Carolina. Among

others, the venerable Bishop Madison, formerly president of William and Mary College, was a frequent visitor, and in 1810, under the *nom de plume* of "*Viator*," published a series of facts and observations, to which the public were indebted for their earliest scientific knowledge of the water.

In 1855 it was analyzed by Professor Gilham, who says:—

One gallon of the water I find to contain—

Carbonic acid	9·360	grains.
Sulphuric acid	53·383	"
Phosphoric acid	0·018	"
Magnesia	7·723	"
Lime	32·150	"
Oxide of iron	0·432	"
Alumina	1·729	"
Potash	0·119	"
Soda	0·359	"
Chlorine	0·092	"
Organic extractive matter	8·733	"

These substances existing together in the water, give rise to carbonates, sulphates, phosphates and chlorides, as follows:—

Carbonate of lime	8·642	grains.
Carbonate of magnesia	1·389	"
Carbonate of protoxide of iron	0·617	"
Free carbonic acid	4·680	"
Sulphate of lime	65·302	"
Sulphate of magnesia	21·098	"
Sulphate of alumina	3·176	"
Sulphate of potash	0·107	"

Sulphate of soda	0·750	grains.
Protoxide of iron	traces.	
Phosphate of lime	0·015	"
Phosphate of magnesia	0·011	"
Chloride of potassium	0·097	"
Chloride of sodium	0·076	"
Organic extractive matter	3·783	"

The water, as its analysis indicates, is decidedly *tonic, diuretic* and mildly purgative.

From seven to eight tumblers taken at intervals, will usually create a mild cathartic effect; as a *diuretic*, it is active; but its evident range of usefulness will be found in its valuable tonic properties. As a beverage it lies lightly and comfortably upon the stomach, when drunk even in large quantities. With many persons, especially on commencing its use, it occasions slight excitation both of the physical and mental system, evidenced by a flushing of the face, a pleasant glow over the body, some increase of the frequency of the pulse, and of the animal spirits.

Its tendency to increase the appetite and promote digestion is very uniform.

In *Dyspepsia* the water has sometimes produced highly beneficial effects.

In that class of *female complaints* demanding the use of tonics, it is a most efficacious remedy, and has often proved very successful.

In diseases of the *Skin*, especially in the various

forms of *Herpes*, it is said to display highly curative powers.

In *old ulcers* it has been found very beneficial; obstinate cases of many years standing, have been successfully treated by the water, used both externally and internally, that had for years resisted the efforts of surgery.

In *Chronic Diarrhœa* it is much relied upon by those who have had most experience in its use. Doctors Edie and Wade, intelligent physicians residing in the neighborhood of the springs, and who have often prescribed the water in this class of cases, commend it very highly.

In *general Debility*, connected with nervous prostration, and unattended with serious visceral obstructions, it will always be found a valuable remedy.

CHAPTER XXXIV.

PULASKI ALUM SPRING.

THIS spring is situated in the northwest portion of the County of Pulaski, on Little Walker's Creek, about ten miles from the town of Newbern, and seven in a direct line from the Virginia and Tennessee Railroad. It is owned by Mr. Hunter, who now furnishes accommodations for about one hundred visitors, and who is actively engaged in so enlarging his improvements, as to make them commensurate with the public demands.

This water has not been analyzed, but it very much resembles, both in its sensible qualities and its medicinal operations, the water of the Rockbridge Alum. It already enjoys a high reputation in its neighborhood, as a remedy for scrofula, cutaneous diseases, and other affections for which the alum waters of Rockbridge have become celebrated.

The fine salubrious climate in which the spring is found, and the convenience with which it can be approached by the railroad, together with the value of its waters as a medicinal agent, make it a place of interest and importance to the spring-going public.

. Dr. Withers, of Newbern, in a communication to the author, thus speaks of his professional experience with these waters: "I have no hesitancy in according to them decided curative effects in some diseases, usually very obstinate; among the number I would mention diseases of the skin resulting from an a-plastic condition of the blood, or from special poisons in the system, such as *Syphilitic Rupia* '*et id omne genus.*' They have a decided tendency to reproduce suppressed *catamenia*, sometimes relieving cases that have obstinately resisted the usual medical treatment." Dr. W. also considers them valuable in certain *liver* affections, and in derangements of the glandular system generally.

CHAPTER XXXV.

GRAYSON SULPHUR SPRINGS.

THE *Grayson Sulphur Springs*, are located immediately on the west side of the Blue Ridge, in the County of Carroll, about twenty miles south of Wytheville. They rise on the banks of New River, in the midst of scenery remarkable for its wildness and grandeur,—in a region as sulubrious and invigorating as any in our country. The neighboring streams abound in fish, and the forests in game of every variety found in our mountains.

Long before these springs were improved in reference to public accommodations, their medicinal virtues were appreciated by many intelligent gentlemen of Wythe County, who were in the habit of making annual visits to the region in which they are situated, with the compound object of hunting, fishing and using the Sulphur waters. Their regular *encampment*, (for the place was not then dignified even with a *cabin*,) was near the source of the healing water, where during the idle weeks of fall, they made themselves happy and healthy, by chasing the wild buck, angling the Blue Cat, and quaffing sulphur waters.

The property is owned by an association of gentlemen living mainly in Wythe County, and is improved pleasantly but not extensively; affording accommodations for from one hundred and fifty to two hundred persons.

The waters of the Grayson have made considerable progress in popular favor in the last few years, and quite a number of people assemble there during the watering season.

The waters are decidedly sulphurous, and have been found useful in dyspeptic depravities, and the various chronic derangements of the chylopoietic viscera. Their earliest reputation, which has been well maintained, was in the cure of rheumatism. For all chronic diseases of the skin, especially for *salt rheum*, *herpes* and *tetters* they will be found efficacious; for chronic forms of liver disease they are well adapted:—and I am informed by highly respectable medical assurances, that they have displayed the happiest effects in numerous cases of amenorrhœa, and in chlorotic conditions of the female system.

There is, quite near the Sulphur Spring, a good *chalybeate*, which may be used to advantage in many cases;—and in nervous affections, and female diseases, it will be beneficial to drink it moderately, in connection with the Sulphur water.

The Grayson waters have been analyzed by Professor Rogers. He shows that in a given quantity of their solid contents, there are found—

Soda	4 grains.
Carbonate magnesia	3 "
Carbonate lime	8 "
Sulphate lime	2 "
Sulphate magnesia	3 "
Chloride sodium	2 "
Chloride calcium	3 "
Chloride magnesium	1¾ "
Sulphate soda	4½ "

Sulphuretted hydrogen and carbonic acid abound in the water.

Dr. R. Crocket of Wytheville, in a letter to the author, speaks favorably, from his own experience, of the use of these waters in diseases of the abdominal viscera generally, but especially, in that form of *dyspepsia* depending upon primary gastric irritation, in *amenorrhœa* and *chlorosis*, in irritations of the bladder, and in the milder forms of skin diseases.

A turnpike-road connects these springs with the railroad at Wytheville.

CHAPTER XXXVI.

HOLSTON SPRINGS.

THE *Holston Springs* are in the County of Scott, in the extreme southwestern angle of the State, near the Tennessee line, forty miles from Abington, five north of Kingsport, and thirty miles east of Rogersville, Tennessee. They are on the bank of the North fork of the Holston River, in a wild and romantic region of country, affording choice facilities to the sportsman in the recreation of hunting or fishing.

One of these springs comes within the thermal range, being 68·5° Fah., or about fifteen degrees higher than the common springs of the surrounding country. Of the saline contents of the water, the most abundant are sulphates of lime and magnesia, and the carbonate of lime, chloride of sodium, muriate of alumina, sulphate of soda, phosphate and sulphate of alumina, are found in smaller proportions. It is represented to be actively diuretic, and under favorable circumstances, determining to the skin by mild diaphoresis; with many it is mildly purgative. Drs. Clapp, Trigg and Preston, respectable physicians of Abington, speak favorably of its

use in diseases which have their origin in a disordered state of the digestive organs; in rheumatism, mercurial diseases, and scrofula, as well as in diseases of the skin, affections of the urinary organs, and in some of the diseases of females.

With proper cautions, the bath here will be found beneficial in many cases in which tepid baths are usually employed.

The water of the Holston Springs was analyzed in 1842, by Professor Hayden, who reports that he found one wine gallon of the water to contain 41·14 grains of saline matter, consisting of—

Chloride of sodium and muriate of ammonia	1·51	grains.
Sulphate of soda	a trace.	
Sulphate of magnesia	12·75	"
Phosphate and sulphate of alumina	a trace	
Carbonate of lime	6·42	"
Sulphate of lime	20·46	"
	41·14	"

CHAPTER XXXVII.

FAUQUIER WHITE SULPHUR SPRINGS.

THE Fauquier White Sulphur Springs are situated in the County of Fauquier, Virginia, fifty-six miles from Washington, and about forty from Fredericksburg.*

The medical quality of the sulphur springs at this place, were known and highly appreciated, long before they were opened to the public. While the virtues of the waters remained in comparative obscurity, the resort of those living in the neighborhood caused such an interruption to the farming operations of the proprietor, as induced him, after every other endeavor to keep out crowds of visitors had failed, to *fill up the spring*.

But so clearly had its virtues been established by the comparatively partial trial of its virtues, that the estate was purchased by Hancock Lee, Esq., one of the present stockholders, with the view of making it a place of public resort.

These valuable waters and grounds are now owned

* "Six Weeks in Fauquier, by a Visitor."

by an incorporated company, under the title of the "Fauquier White Sulphur Springs." The real estate, which, with the improvements and personal property, constitute the principal stock of the company, consists of about two thousand nine hundred and thirty-four acres of land, lying upon and on both sides of the Rappahannock River.

The springs establishment consists of an elegant brick pavilion, which, including the wings, is one hundred and eighty-eight feet in length, by forty-four in width. It is four stories high, and capable of accommodating four hundred persons. Across the street, and directly opposite the pavilion, stands what is called the "new building," which is also of brick and four stories high, one hundred and five feet long, and thirty wide. There are also ninety cabins or rooms, separate and distinct from the pavilion and new building. Those visitors, who from ill health or other causes, desire the quiet and comfort of their own homes, added to the healthy and balmy breezes that steal through the valley, obtain one of these cabins, which, being arranged on the northern and southern sides of the square, and amid the serpentine and shady walks and playing fountains, contribute much toward making a somewhat distant southeast view of the premises picturesque and beautiful.

There is here an elegant and commodious bathing establishment, complete in all its arrangements and

constantly supplied with the sulphur water, of any desired temperature. The architecture of this building is Gothic and forms an additional ornament to the springs.

The first impression of the stranger on arriving here, especially if it be his first visit to a watering place in Virginia, cannot be otherwise than agreeable. The friendly shake of the hand, the true Virginia welcome, "right hearty" and sincere, which he receives from the principal managers, will cause him to feel that he is not a stranger in a strange land, but among those who are ready to participate and enjoy, in common with himself, all the comforts, pleasures and recreations of the valley of Fauquier.

The sulphur springs, surrounded by a tasteful octagonal pavilion, and supplied with seats, is situated in a verdant valley, about one hundred and fifty yards from the dining hall. It is most frequently visited at morning and evening, when it not unfrequently presents a scene of beauty, cheerfulness and rational mirth, mingled with entertainment and instruction.

According to analysis, which however is regarded as very imperfect, the water is impregnated with *sulphate of magnesia*, *phosphate of soda*, and *sulphuretted hydrogen*. Its temperature is 56° Fahrenheit, 10½° Raumer. It has a strong sulphuric smell, and the taste being not unlike the odor arising from the yolk of a hard-boiled egg, is not, perhaps, at first

very agreeable to the palate of a *gourmand.* With some reluctance, and possibly a few wry faces, two or three glasses may be drank during the first day. This disagreeable taste, however, is soon changed to impatient longings, and even a strong *appetite* for the water, till anon, five or six tumblers full before breakfast, or twenty glasses during the day, are not considered an immoderate dose. The water operates *purgatively* and *diuretically;* the cuticular pores being opened and perspiration, especially if the weather be warm, flows easily and copiously.

The waters of Fauquier are not as strong as the sulphur waters of Greenbrier and Monroe, and consequently will not act so soon or so powerfully on the system as the latter. But they are in deservedly high repute as an *alterative*, and the very gradual way in which they affect the system, gives them a preference to stronger waters in some cases!

They are thought to be very valuable, particularly in certain dyspeptic depravities, and in dropsical affections.

The Hon. B. Watkins Leigh, late United States Senator from Virginia, was cured of a dropsy by the use of these waters in 1838, after having undergone the operation of *paracentesis* for the disease.

CHAPTER XXXVIII.

BUFFALO SPRINGS.

THE *Buffalo Springs* are situated in the County of Mecklenburg, a few miles south of Dan River, and seven west of the town of Clarksville.

They were known as mineral waters probably as early as the beginning of the present century, and were resorted to by the people of the neighborhood as a remedy in cutaneous diseases, chronic ulcers, etc. etc. Some forty or fifty years ago, several of the neighboring planters on the Dan and Staunton Rivers erected cabins near the springs, and occupied them during the summer months. They did not, however, become a place for the resort of invalids until about the year 1835.*

These springs are conveniently approached from different directions. Their distance from Richmond is one hundred and forty-four miles, and from Petersburg one hundred and twenty-four, all the way by railroad, with the exception of seven miles staging.

The *analysis* of this water shows it to be a sul-

* Dr. S. H. Harris's Pamphlet, published in 1850.

phated chalybeate. Its temperature, as it flows from the earth, is 60° Fah. Its specific gravity is 1·058.

The solid contents obtained by evaporating one wine gallon of the water, is found to consist of—

Sulphate of magnesia	8	grains.
Sulphate of lime	8·5	"
Sulph. of protoxide of iron	2·6	"
Chloride of sodium	a trace.	
Chloride of magnesium	a trace.	
Sulphate of soda	1·8	"
Sulphuretted hydrogen gas	0·54080	"
Total of solid and gaseous contents	15·94080	"

Dr. Harris, whose eminence in his profession, and long familiarity with the use of the Buffalo waters entitle his opinions on this subject to the utmost respect, thus speaks of their therapeutic effects on the system:—

"The first effects produced by drinking the water is a flushed face, a quickened pulse, and some giddiness of the head. These symptoms soon pass off, however, and are followed by an increase of appetite, a healthful glow on the surface, with more or less perspiration, and a pleasing consciousness of new life and vigor infused into every organ of the body. Very active, and sometimes incipient diuresis supervenes, and continues as long as the water is used. Occasionally, some slight purging takes place for the

first day or two, but unless the mucous membrane of the bowels was previously inflamed, or very irritable, the protracted use of the water is attended with constipation.

The water is decidedly stimulant, and of course contra-indicated in all diseases of an acute inflammatory character; as, likewise, in all cases of hæmorrhage of the lungs, or acute diseases of the bronchial tubes. As a mere tonic, however, it is not wholly inadmissible in chronic affections of the chest; but should never be resorted to without satisfactory evidence of the absence of tuberculous diseases of that cavity. Its stimulating effects, added to the pre-existing excitement in this limited class of diseases, constitutes 'the head and front of its offending.'"

"A practice," continues Dr. H., "of more than twenty years in the immediate neighborhood of this spring, has afforded opportunities of testing the efficacy of the water in a great variety of cases. As a tonic, diuretic, sudorific and emmenagogue, it has been prescribed and freely used in every conceivable species of malady, in which medicines belonging to these several classes were supposed to be indicated. And although not always with the complete success desired, yet rarely ever without amendment, or some amelioration in the general health of the patient, except in the cases already specified.

The principal morbid states to which it seems to be well adapted, are dropsical affections, visceral

obstructions, protracted intermittent and remittent fevers; chronic diseases of the skin, dyspepsia, convalesence from fevers of every grade and type, female complaints, and almost every disease of the pelvic organs in both sexes."

The happy blending of *tonic* and *alterative* powers in these waters, constitute them a valuable remedy in a comprehensive class of cases in which these two important influences are demanded for the restoration of health.

In the sallow or jaundiced condition of the skin common to denizens of warm miasmatic districts, and always connected with hepatic derangements of some sort, these waters will be used with excellent success. In the milder obstructions of the liver, spleen and kidneys, as well as in obstructions in the lesser glands of the system, and in paucity or poverty of the blood, their employment will be valuable. We should look also for highly beneficial results from the judicious use of the waters in chronic irritation of the mucous coat of the bowels, bladder or urethra, as well as in that wretched form of disease technically known as *spermatorrhœa*, a legitimate and not unfrequent result of youthful improprieties.

In certain forms of female affections, particularly in amenorrhœa, dismenorrhœa, chlorosis or leucorrhœa, where no condition of the general system contra-indicates their use, they will, doubtless, be eminently serviceable.

In directing as to the manner of using the waters, Dr. Harris very properly condemns the over-doses of it but too frequently indulged in. He thinks, that three or four glasses before breakfast, and the same number before dinner, with an occasional glass in the evening, are altogether sufficient, and remarks that a larger quantity than this produces an over-distention of the stomach, and sometimes an almost incessant micturition. In chronic diarrhœa, it will only be borne in very small and oft-repeated doses, and the same remark will be found true in all cases attended with irritability of the alimentary canal.

CHAPTER XXXIX.

NEW LONDON ALUM SPRING.

For a number of years it has been known that alum is a constituent part of a rock that is found in large masses near the town of New London, in the County of Campbell, ten miles southwest of Lynchburg. An excavation made several years ago into the ground, penetrating this rock, but with no view of obtaining alum water, the virtues of which were not then appreciated, has, from the percolation of water through the layers of rock, afforded an alum of sufficient purity to be used by the good housewives of the vicinity for "setting their dyes."

The medical reputation acquired within the last few years by the alum waters of Rockbridge, induced the proprietor of this rock, P. Echols, Esq., to sink a shaft or well into it, with the hope of obtaining alum water in sufficient quantity to be used for medicinal purposes. His enterprise has been crowned with entire success. On penetrating the rock to the depth of sixteen feet, he came to several seaps or percolations of water, furnishing a sufficient amount

to induce him to suspend further operations and to cut an entrance into the basin, or spring, after the manner of ancient wells, and of sufficient size to admit of easy ingress and egress to and from the fountain.

This water has been much used since its discovery, for various diseases, and as popular fame alleges, and as several sensible and judicious persons in the neighborhood have assured me, with very great advantage.

Three or four glasses a day, will operate gently upon the *bowels* of some persons; it very decidedly promotes the secretion of the *kidneys;* but its leading operation is that of a generous *tonic* and astringent to the animal fibre, increasing the appetite and strengthening the general system.

It is a water that is attracting public attention, and now occupies a favorable position among waters of its class.

It has been analyzed by Professor Gilham with the following results:—

"A gallon of water furnished the following mineral constituents:—

Sulphuric acid	59·008 grains.
Magnesia	4·320 "
Protoxide of iron	11·112 "
Alumina	4·072 "
Lime	7·768 "
Potassa	5·064 "

If we suppose, which is the most probable supposition, that the sulphuric acid forms simple combinations with the above bases, in the proportions of one atom, or equivalent, of acid, to one atom, or equivalent, of base, we shall have the various salts of the acid in the following proportions:—

Sulphate of	magnesia	12·664 grains to the gal.
"	prot. of iron	23·456 "
"	alumina	7·240 "
"	lime	18·672 "
"	potassa	10·160 "

And, in addition, we have of *free* or uncombined sulphuric acid, 19·976 grains."

This analysis of Professor Gilham will give confidence as to the component parts of this water, while it indicates, as far as can be done by chemistry, its appropriate medicinal adaptations.

Suggesting now, as heretofore, when treating of the analysis of other waters in connection with their medicinal use, the uncertainty of any analysis as a basis for the administration of mineral waters, I remark, that we have a new and valuable light in this particular case, not always accessible to new and untried waters. Between the analysis of this water, and the alum waters of Bath and Rockbridge, whose reputation and adaptations are now pretty well established, there is a similarity in several respects, so striking as to induce the belief that they are suited to the same general range of disease.

The intelligent physician, at all acquainted with the peculiar action of the alum waters, and looking to the leading indications afforded by the analysis of this, will not fail to perceive that it is pointed out as a valuable remedy in a large circle of cases that require an *alterative tonic treatment.* It will be found valuable in the various forms of *Salt Rheum*, as such waters invariably are; while its good effects in *Chlorosis*, and other female affections, unattended with febrile action, may be looked to, we would think, with decided confidence.

In *anæmic*, and other conditions of the system demanding the use of *tonic* remedies, this water may be used with excellent effect. In cutaneous and ulcerative affections, in primary nervous diseases, in profluvia, and passive hæmorrhages, it will be found well adapted.

CHAPTER XL.

CHURCH HILL ALUM SPRING.

In the process of grading a street in the City of *Richmond*, recently, an *Alum Spring* was discovered, which, judging from its reported analysis, must be regarded as among the strongest waters of its class.

Doctor John Bell* states, "that an analysis by Professor Booth, shows it to contain 184·5 grains of alkaline salts, 159·5 of salts of iron, and 7·3 of persulphate of alumina in a gallon. Of the alkaline salts, nearly one-half is Epsom salts. On this account it is generally aperient, while, at the same time, owing to its large aluminous and chalybeate impregnation, it manifests actively tonic and astringent properties."

He adds, "that it is used to a considerable extent in Philadelphia, and that he has prescribed it in several cases with decided benefit."

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* Mineral and Thermal Springs in the United States and Canada.

CHAPTER XLI.

SPRINGS OF KENTUCKY.

HARRODSBURG SPRINGS*—These springs are situated near the source of Salt River, and in the immediate suburbs of the town of Harrodsburg. They have been extensively and handsomely improved, and in the language of Dr. Drake, will in this respect, "compare advantageously with any to be found in America or Europe."

Dr. Raymond's analysis shows, that *one pint* of the water of the GRENVILLE SPRING, contains—

Carbonate of magnesia	2·87 grains.
Bicarbonate of lime	0·86 "
Sulphate of magnesia (crystallized)	16·16 "
Sulphate of lime (crystallized)	11·06 "
Chloride of sodium	a trace
	30·95 "

One pint of the SALOON or CHALYBEATE SPRING, contains—

* To Dr. Drake, who was one of the brightest philosophical lights of the profession in America, we are principally indebted for our knowledge of the Springs of Kentucky.

Bicarbonate of magnesia	0·43	grains.
Bicarbonate of lime	4·81	"
Bicarbonate of iron	0·50	"
Sulphate of magnesia (crystallized)	27·92	"
Sulphate of lime (crystallized)	10·24	"
Chloride of sodium	1·24	"
	44·60	"

Dr. Raymond could not detect either free carbonic acid or sulphuretted hydrogen gas.

The water of the Grenville Spring is the better antacid—that of Saloon, the better tonic. Indeed, small as the quantity of iron is, it sometimes produces an uncomfortable feeling in the head, which is relieved by drinking at the other fountain. In reference to the *excretions*, the water from both acts upon the bowels, kidneys, and skin. Beyond these sensible effects, it pervades the whole constitution, and many classes of invalids very soon feel a renovation of appetite, strength, and cheerfulness, although its primary effects seem to be sedative, not stimulant.

Dr. Drake remarks, that "these waters are very beneficial in chronic inflammations and obstructions of the abdominal viscera; in such cases of dyspepsia as are attended with subacute gastritis; and in almost every kind of hepatic disorder, except when the liver is indurated, and consequently, incurable. They are almost equally beneficial in chronic inflammations of many other parts of the system—especially of the serous and fibrous membranes. In tonic

dropsies, in rheumatism, and in various affections of the periosteum from febrile metastasis, from syphilis, and from mercury, they have often effected a cure, when other means had failed." He also speaks very favorably of their employment in urinary disorders, and chronic diseases of the skin. He enjoins caution in their use in pulmonary complaints, and considers them hurtful in vomica, tubercular suppurations, and hepatization of the pulmonary tissue.

ROCHESTER SPRING, according to Dr. Drake, is a feeble but constant stream, that bursts out about sixty feet below the summit of a ridge of coarse-grained, shell limestone. It so nearly resembles the waters just described, that a detailed account of its waters would be superfluous. It is one mile from Perryville and twelve from Harrodsburg.

The OLYMPIAN SPRINGS constitute one of the oldest and most noted watering places in Kentucky. They are situated in Bath County, about fifty miles east of Lexington, on the waters of Licking River, which unites with the Ohio, opposite Cincinnati.

There are several springs and wells, which present such differences in their composition, that of all the watering places of the West, this has been supposed to afford the greatest variety; but Dr. Drake remarks: "I could not myself detect more than three kinds—

a *Salt and Sulphur*, a *White Sulphur*, and a *Chalybeate.*

"The SALT AND SULPHUR WELL contains sulphuretted hydrogen, muriate of soda, carbonate of soda, and perhaps a little muriate of lime.

"The WHITE SULPHUR SPRING is situated half a mile from the well. This spring is said to have made its first appearance during the earthquakes of 1811. Its temperature is 59°. Its composition is essentially the same with that of the well just described, but the ingredients of the two vary in their proportions. The quantity of sulphur is greater in the spring than in the well; on the other hand, the spring has but a weak impregnation of muriate of soda compared with the well. The proportion of carbonate of soda is nearly the same in both.

"The CHALYBEATE SPRINGS are two in number, and are situated about forty yards apart, and half a mile from the Salt and Sulphur Well. They are simple carbonated iron waters."

The Salt and Sulphur waters, Dr. Drake informs us, are principally drunk; of these, from one to eight tumblers are taken in the morning. Its diuretic effects are prompt, its action upon the bowels very inconsiderable.

BLUE LICK SPRINGS.—At this place, Dr. Drake tells us, there are several springs, all essentially of one kind—the *Sulphurous Saline*. They are situated on the bank of Licking River, twenty-four miles from the Ohio, and on the main road that leads from Maysville to Lexington. From the early settlement of the State until within the last eighteen years, salt was manufactured at this place.

The analysis of the Blue Lick Waters by Professor Peter* shows that its gaseous contents consist of sulph. hydrogen and carbonic acid; and its solid contents, of the carbonates of lime and magnesia, the chlorides of potassium, sodium and magnesia, the sulphate of lime, and potash, bromide of magnesium, iodide of magnesium, silicic acid, with a small amount of alumina, phosphate of lime, and oxide of iron.

The solid contents of the Blue Lick water are to those of the White Sulphur, as rather more than nine to two. In the former are sixty-four grains of chloride of sodium, or common salt, to the pint; in the latter, but a small fraction. The first contains about three and a half grains of sulphate of lime, the second about ten grains. The White Sulphur holds in solution, however, sulphates of magnesia and soda, both of which are wanting in the Blue Lick; while in its turn the latter has chloride of potassium,

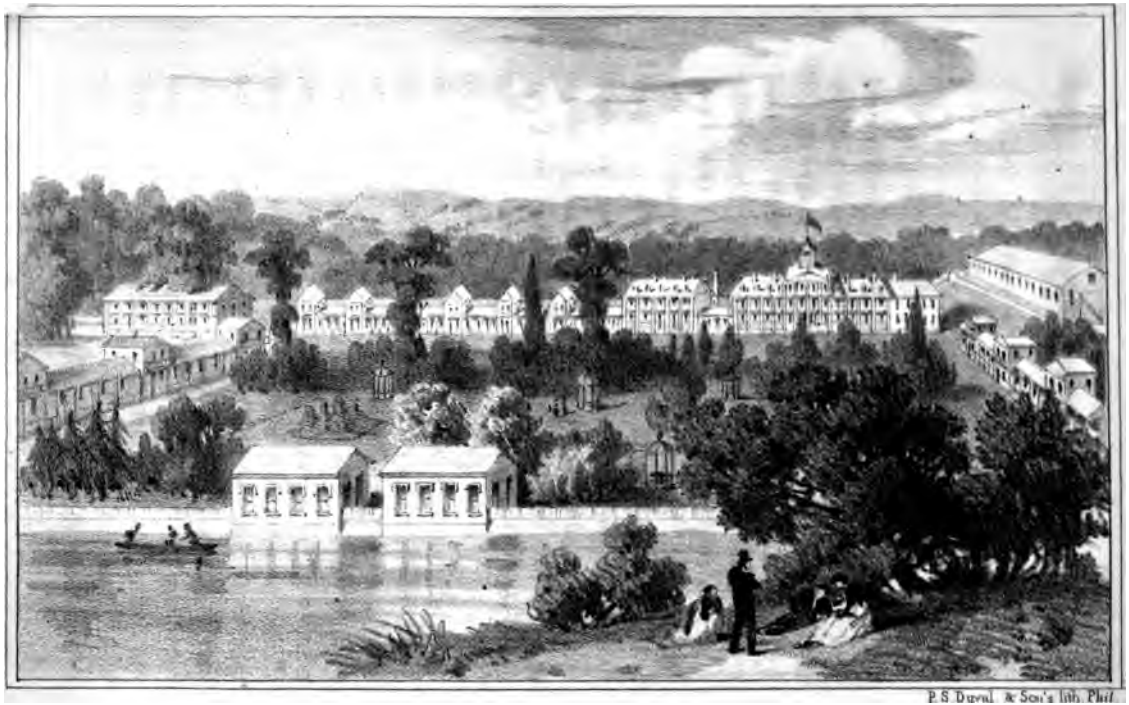
* Mineral and Thermal Springs, by Dr. John Bell.

and sulphate of potash and bromide of magnesium, which are not in the former. The quantity of sulph. hydrogen in the Blue Lick is double that in the White Sulphur. Iodide of magnesium is found in both.

The medical virtues of the Blue Lick water are those of a *saline sulphur*, and are analogous to, but more active than, the Olympian Spring water. It acts freely as a diuretic; but only occasionally as a purgative. It may be used with advantage in nearly all the chronic diseases in which the sulphur waters already described have been recommended. The water employed as a bath, can be very properly connected with its internal use.

ESTILL SPRINGS, in Estill County, are sulphurous waters. There are two springs here, called *White* and *Red* Sulphur.

The White Sulphur contains 0·09 per cent. of solid contents—the Red, 0·04 per cent., consisting in both cases of carbonates of soda, lime and magnesia; sulphates of lime, magnesia and soda; chlorides of sodium, calcium and magnesium, with hydro-sulphate of soda, and a trace of carbonate of iron.



OHIO WHITE SULPHUR SPRINGS.

MINERAL SPRINGS OF OHIO.

OHIO WHITE SULPHUR.—Near the geographical centre of Ohio, in the County of Delaware, and immediately on the West bank of the Scioto, surrounded by a country broken, hilly, and beautifully picturesque, arises the *Ohio White Sulphur*. The Scioto is here a rippling, rapid stream, hastily flowing and fretting over beds of boulder rocks, and skirted for many miles above and below the spring, by slopes or banks of considerable elevation, which gently spread out into undulatory table-lands, charmingly interspersed with valley and hill, and blessed with an atmosphere free from malarious influences at every period of the year, and as salubrious as is found in our high mountain ranges.

Under the name of *Hart's Spring*, this place has been known for its mineral waters for more than twenty years. The circumstance that led to its improvement as a spring property by Mr. Hart, its former proprietor, is worthy of note. He had visited the White Sulphur Springs in Virginia, for the relief of a complicated stomach and liver complaint; returning to Ohio cured of his disease, his attention was called to this Artesian sulphur fountain, and upon examination, he found its waters so strikingly to resemble those of the Virginia Spring, as to in-

duce him to purchase and improve it in view of its medicinal value.

The property has recently been purchased by Mr. A. Wilson, of Cincinnati, whose energy, good taste, and ample means, are being actively exercised in enlarging its accommodations, and still further beautifying the place, already, by the bounties of nature, surprisingly beautiful.

The buildings for visitors are pleasantly situated on a beautifully undulating plateau, at an elevation of perhaps one hundred and twenty feet above the level of the river, and about eight hundred feet distant from it. With those now in progress to completion, the accommodation will be ample and comfortable for six hundred persons. The *drawing* of the grounds, including the various improvements on the spring lawn, that accompanies this article, renders a particular description of them unnecessary.

The good taste and liberality of the proprietor of this property seem to be untiring in suggesting and carrying forward new means of comfort and amusement for his visitors, as well as for their more beneficial use of the waters. To these ends, a charming wood lawn of a hundred acres, adjoining the spring lawn, has been laid off in walks and carriage-drives, and extensive *bathing-houses* have been erected, furnishing not only warm and hot tub-baths, but also with arrangements for employing *douche* and *sweat* baths; these cannot fail, from the high mi-

neral impregnation of the water, to prove eminently valuable in a great variety of cases.

The construction of *douche* and *sweating baths* of sulphur water, to be employed under proper circumstances, in connection with the internal use of the water, is a matter of the utmost importance to the successful treatment of numerous cases that resort to mineral springs.

The water for bathing is here heated by *steam*, in the tub in which it is used. This is a vast improvement over the old method of heating mineral waters for bathing. Under the old plan of heating in a boiler, and thence carrying the water to the bathing-tub, much of its valuable saline matter was precipitated and lost. By this improved method of applying steam to the water in the tub, the heat is never so great in raising the water to the bathing point, as to cause any important precipitation of its salts; hence they are left in their natural suspension in the water, to exert their specific effect upon the bather. Not only so, but, by this improved method, hot steam may be let into the tub, from time to time, as the water cools, so as to keep it essentially of the same temperature during the entire process of bathing; a consideration often of no small importance. This method of heating mineral waters in the tub in which they are used, in connection with *douche* and *sweating* baths, brings warm and hot bathing at this place, in fair competition with bathing at naturally Warm and Hot

Springs, and will be productive of the same good effects that are experienced from bathing in such springs.

The Ohio White Sulphur fountain is a curiosity in hydraulics. Its waters arise in a boring made through solid rock that underlies the bed of the river, and are thrown up by subterranean power one hundred and sixty feet to the surface of the earth, where a pipe is attached to the mouth of the boring, or well, along which, by means of the same subterranean power, they are propelled a distance of near three hundred feet, and to an elevation of some sixty feet above the level of the river. Here they flow into a beautiful marble reservoir, the fountain from which the water is received for drinking. From the base of this reservoir the water is conducted under ground to the *bath-rooms*, and from thence to form a beautiful *jet d'eau* in its exit to the river, into which it falls when released from its utilitarian purposes.

A hydrodynamic problem here very naturally arises in the inquisitive mind. By what power is this volume of water made to rise more than two hundred feet perpendicularly above its source in the bowels of the earth?

Writers on physics assert that there are but two known forces that account for such phenomona; *first*, a *gaseous* force, and it is alleged that when water is propelled by such a force, it always flows

more or less *per saltum*, and not in a constant regular stream; *second*, the well-known force, or principle, by which water finds its own level. Now this water does not come up *per saltum* in any degree, but in a continuous, bold, dashing current. When we look around in search of a probable elevation from which it might come, we find it not in the State of Ohio, nor in many hundreds of miles in any direction, except in the great Apalachian chain of Virginia or Pennsylvania, and the nearest of these, perhaps two hundred miles distant. Do these sulphur waters, as such, come from the great Alleghany supplies that are known to exist, and are so frequently found issuing from the base of that range of mountains in Virginia? or, do they receive their mineral impregnations near the place where they arise, and is there some force not yet understood by which water may be propelled to great heights above its natural source?

Interesting as this question may be, I must leave its ultimate decision to those more deeply versed in the *arcana* of nature.

This fountain, as valuable as a medicinal agent as it is curious in physics, was first discovered about thirty-four years ago.

A gentleman, by the name of Bachus, was boring at this place for salt water, and after penetrating the solid rock to the depth of one hundred and sixty feet, his auger suddenly sunk two feet, and the sul-

phur water gushed out. Not then appreciating the value of this discovery, he continued his boring, still through solid rock, to the farther depth of three hundred and thirty feet, when he reached salt water, but not of sufficient strength to justify its evaporation into salt as a business. Subsequently the lower boring was plugged, and the sulphur water alone permitted to flow up.

The hole, along which the water rises, is seven and a half inches in circumference, up which it rushes with tremendous force, at the rate of one hundred and twenty gallons a minute, or seven thousand two hundred gallons per hour.

To convey some idea of the volume of this subterranean current of sulphur water, and the rapidity with which it is forced along its channel, we are told that an attempt was made to introduce a copper tube from the surface to the bottom of the well, and that very soon, that portion of the tube that entered the current, became bent and flattened by its force.

Although these springs have but for a few years attracted much of public attention, enough is satisfactorily known of them to enable us to welcome them to a prominent position among the watering places of the country.

Their geographical position being central in the great and flourishing State in which they are situated, and essentially so as between the population of the Southwest and the watering places of the Middle

and Northern States; the ready facility with which they are approached by railroad from every direction; and, above all, the medicinal value of their waters, point them out as a place of very large valetudinary and fashionable resort by the people of America. So fortunately are they located in reference to accessibility, that visitors from North, South, East or West, can approach within four miles of them on unbroken chains of railroad.

The elevated and healthful country in which they are situated, with the established fact of its entire freedom from malarious influences at all seasons of the year, give to persons who are seeking a healthful climate, for a summer retreat, a reliable assurance of finding such at this place.

The waters of this sulphur fountain have been analyzed by Professor E. S. Wayne, of Cincinnati, who shows that their gaseous contents consist of—

Sulphuretted hydrogen,	Carbonic acid.

Their solid contents of—

Sulphate of lime,	Carbonate of lime,
Sulphate of magnesia,	Oxide of iron,
Chloride of calcium,	Sulphuret of calcium,
Chloride of sodium,	Iodine,
Chloride of magnesium,	Organic matter.

The temperature of this spring, winter and summer, is 52° Fah.

This analysis shows that the water holds in solution many of the best ingredients found in the most celebrated waters of Europe and America, and indicates its adaptation to a large circle of chronic diseases to which humanity is subject.

While this water strongly resembles the Virginia White Sulphur in several respects, it is still more like the waters of Avon and Sharon Springs in New York, than any other with which I am familiar. The two latter waters differ somewhat from each other, and so will this be found to differ from both; nevertheless the likeness is not inapt between them in many essential particulars.

The author visited and spent some time at these springs in the fall of 1857, and again in 1858, with the view of examining the waters, and ascertaining, by scientific research and practical observation, their peculiar characteristics and medical adaptations. The field of observation while at the springs, was too limited to mature conclusions as definite and positive in reference to the specific character of the waters as was desirable; but in all cases in which I witnessed their use, the effects were highly satisfactory; and many intelligent persons, among them medical men of high reputation, who had used the waters, assured me of their beneficial effects. But any want of observation upon my part has been fully supplied by Dr. W. W. Dawson, of Cincinnati, a gentleman of science and learning in the profes-

sion, who spent the entire summer of 1858 at the springs. In his "*Observations at the Springs in* 1858," he gives a clear and satisfactory account of the curative power of the water in dyspepsia, and the various depravities of the stomach; in diseases of the liver, and in various chronic affections of the bowels and kidneys.

Dr. Dawson reports a very interesting case of *chronic Pericarditis* that was entirely cured by the water. He recommends its use in congestion of the lungs and tracheal tubes. In a case of chlorosis that came under his observation, it was signally successful; and decided benefit was derived from its employment in cases of dropsical effusions.*

Dr. D. informs us he had but little opportunity of seeing the waters tested in rheumatism, or in severe affections of the skin. But from my observations of the value of similar waters in those diseases, I should have great confidence in their use in such cases, especially when their internal use is connected with the warm or hot sulphur baths. I would make the same remark in reference to mercurial disease, commonly so called, or *secondary lues*, often *habitué* of mineral fountains; in such cases we may look to the free internal use of the water, with hot sulphur bathing, with much hope.

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* Observations at the Ohio White Sulphur Springs in 1858, by W. W. Dawson, M.D.

CHALYBEATE SPRINGS.—In addition to the sulphur Artesian fountain of which we have been treating, there are in close proximity to it, and within the spring lawn, three other mineral springs deserving of notice. They are all impregnated with *iron*, two of them strongly so. They are known as the *Chalybeate*, the *Magnesian*, and the *Saline Chalybeate* Springs.

The water of the *Chalybeate* is beautifully transparent and sparkling, of pleasant taste, and of the uniform temperature of 56° Fah.

Professor Wayne's chemical examinations found this spring to contain—

Sulphate of iron,	Chloride of calcium,
Oxide of iron,	Carbonate of lime,
Sulphate of magnesia,	Iodine,
Sulphate of lime,	Potash,

Organic matter.

Like other waters of its class, in which the chalybeate decidedly prevails, it is essentially tonic and alterative, and may be prescribed with advantage in cases of paucity or poverty of the blood, when unconnected with obstinate visceral obstructions; in general debility resulting from prior violent disease, or from hæmorrhagic or other discharges from the stomach, bladder, bowels or womb. In long-continued intermittents, and in dropsical effusions, they will prove beneficial. As a secondary remedy, following the use of sulphur waters, chalybeates

often prove eminently serviceable in restoring the energies of the system and hastening a cure; this is especially the case in neuralgia, and in that peculiar stomach affection known as gastralgia, as well as in that nervous and debilitated state of the system the result of excessive or improper indulgences.

In leucorrhœa, chlorosis, and amenorrhœa and its general attendant sterility, such waters have always enjoyed a high and well-deserved celebrity; indeed, if chalybeate waters had no other claim to confidence than their admitted efficacy in curing the obstinate and health-undermining obstructions in females, they would still stand a choice boon of a beneficent Providence.

THE MAGNESIAN SPRING is shown by Professor Wayne to contain iron, magnesia, lime, potassa, iodine and organic matter.

The principal difference between this and the Chalybeate Spring, is occasioned by its containing a large amount of sulph. magnesia, but a smaller amount of iron than the chalybeate, which, consequently, render it more purgative, but less tonic, than the latter. Indeed, the waters of this spring contain a sufficient amount of magnesia to make it, when freely drunk, decidedly purgative.

The occasional use of proper quantities of this water by patients using the sulphur or chalybeate, and when these waters do not sufficiently move the bowels, may often be highly beneficial.

THE SALINE CHALYBEATE SPRING has not heretofore been much used. Dr. Wayne examined it chemically, and found it to contain, besides carbonic acid gas, oxide of iron, chloride of calcium, sulphate of lime, sulphate of magnesia, carbonate of lime, with small quantities of potassa, iodine and organic matter.

As a medicinal water, it differs in no leading or important respect from the Chalybeate Spring.*

THE YELLOW SPRING is in Green County, two miles west of the Miami River, and sixty-four north of Cincinnati. Dr. Drake states that "it is a copious and constant fountain, that issues between strata of arenaceous limestone, and thus has geological characters perfectly identical with the Chalybeate Springs of the Olympian valley in Kentucky." The temperature of the water is the same as of the other springs of the neighborhood, 52° Fah. The water is beautifully transparent, with a slight ferruginous taste, and is said to resemble in its composition the other limestone springs of the country, with the addition of the carbonate of iron.

Dr. Drake informs us "that its water is *diuretic* and slightly *laxative*, if it can be considered as having this effect at all with any uniformity." He con-

* *For a full account of these waters, see a pamphlet entitled the "Ohio White Sulphur Springs."*

siders the water rather restorative than curative, and as such, is valuable for convalescents. He regards it as a pleasant tonic, and hence valuable in cases of debility, or exhaustion following previous violent attacks, and in nervous disorders.

THE WESTPORT SPRING.—It arises (Dr. Bell) "in the bed of Deer Creek, a tributary of the Scioto River, from a vast bed of clay-slate, which for many miles forms the bed of the creek." It is a bold fountain, yielding some twenty gallons of water a minute. It belongs to the *saline class*, and contains sulphate of magnesia and iron, the latter being held in solution by carbonic acid, which gives the water a lively and sparkling appearance as it rises to the surface. The water is said to be mildly cathartic. It will doubtless be found valuable in dyspepsia, gastralgia, and a numerous class of functional derangements of the chylopoietic viscera.

CHAPTER XLII.

MINERAL SPRINGS OF TENNESSEE.

NATURE has been bountiful to Tennessee in the number and variety of her mineral springs. But few of them, however, have been improved for public visitation, nor have they, as a general thing, made out a satisfactory record of their medicinal applicabilities.

WHITE'S CREEK SPRING is twelve miles from Nashville. It is held in high estimation by many, and is considerably resorted to. It is said to contain *sulphur*, *iron* and *magnesia*, the former in large proportion. In *cutaneous* disorders and *calculous* affections it has been much praised for its curative powers.

ROBERTSON'S SPRINGS belong to the class of *saline* waters. They are twenty miles from Nashville.

WINCHESTER SPRINGS are four miles from the pleasant town of Winchester, in Franklin County, on the Nashville and Chattanooga Railroad, seventy miles from Nashville, and fifty from Chattanooga.

There are here, in close proximity, *four* different springs, Red and White Sulphur, Chalybeate and *Freestone*. These springs enjoy considerable celebrity and patronage, and are well worthy of attention both as a place of healthful and pleasurable resort.

In the same neighborhood, and but *four* miles distant, other springs have been discovered, called ALLISONA SPRINGS. They resemble the Winchester Springs in quality, and promise to be of equal medicinal value.

BEERSHEBA SPRINGS are on the summit of one of the spurs of the Cumberland Mountain, in the County of Grundy, about twelve miles northeast from McMinnsville. They have come into notice as a watering place within the last four years.

The water is a saline chalybeate, and is regarded as a valuable tonic alterative.

These springs have been tastefully and conveniently improved for the accommodation of from four to five hundred persons.

The scenery surrounding the Beersheba Springs is both beautiful and picturesque, and remarkable alike for its extent of range and its wild and romantic prospects.

There are here some fifteen or twenty elegant cottage residences, belonging to, and generally oc-

cupied by, wealthy families of Nashville, and other parts of the Southwest.

The society, assembled at this place during the summer, is always select, elegant and cultivated, and this, in connection with the value of the waters, and the salubrious character of the atmosphere, make *Beersheba* a very desirable summer retreat.

Through the entire circuit of East Tennessee, as bounded by the Cumberland range of mountains on the North, and the Blue Ridge on the South, mineral waters are abundant, and some, particularly of the *saline* and *chalybeate* character, have been demonstrated to be of excellent quality.

MONTVALE SPRINGS are in Blount County, twenty-four miles south of Knoxville. They belong to the *saline* class.

The analysis of these waters by Professor Mitchell, shows that they contain in one gallon of water—

Chloride of sodium	1·96
Sulphate of magnesia	12·00
Sulphate of lime	74·21
Sulphate of soda	4·51
Carbonate of lime	13·26
Carbonate of iron	2·40

They also show traces of potash and organic matter, with an excess of carbonic acid.

The *Montvale* are valuable waters, and very favorably represent the class to which they belong. In

many of the *dyspeptic* depravities, and generally in the chronic disorders of the abdominal and pelvic viscera, they are used with great success.

They enjoy considerable reputation in the cure of *chronic diarrhœa*, a disease very common and very fatal in our extreme Southern latitudes. In the summer of 1854, the author spent several weeks at Montvale, and witnessed the operation of its waters in quite a number of cases of this disease. In those in which it was used in quantities, but slightly provocative of increased operations from the bowels, and in which a guarded forbearance in diet and general living was observed, it proved eminently useful, and especially in cases connected with, and kept up by, depraved biliary secretions. While, on the other hand, those who used the water in full purgative doses, derived no benefit, and some were injured. The best article in the *Materia Medica* may be so misused as to render it inert or injurious, and the invalid at this, and all the mineral springs, should remember, that it is not, as many seem to suppose, to *drink and be healed*, but *so to drink* as to secure the proper and sanative effects of the agent.*

The waters of the Montvale more resembles those

* See account of *Montvale Springs*, by J. J. Moorman, M.D., published in 1855.

of the *Alleghany* Springs in Virginia, than any other with which we can compare them.

TATE'S SPRINGS are in the County of Granger. They are *saline* waters, and are very like those of *Montvale*, but hold in solution a larger amount of iron.

LEE'S SPRINGS are twenty miles east of Knoxville. There are here two *Sulphur* and a *Chalybeate* Spring. The sulphurs are good waters of their class; the chalybeate is pure and strong, and superior to many waters of its kind.

At the town of Rutledge, in Granger County, is a very strong sulphurous spring, and near *Bean's* Station, in the same county, are several beautiful fountains of sulphur water, abounding in red and white deposits.

ALUM SPRINGS.—I have examined the waters from an *Alum Spring* found near *Rogersville*, in Hawkins County, which compare favorably with any alum waters that are known.

WARM SPRING.—It is said that on the French Broad River, near the North Carolina line, there is a Warm Spring of 95° Fah., issuing from the bank of the river.

SPRINGS OF NORTH CAROLINA.

North Carolina is not remarkable for mineral springs; the most noted are the

WARM AND HOT SPRINGS OF BUNCOMBE.—These thermal fountains arise on the western bank of the French Broad River, and so near the stream that in times of high freshets they are overflown by its waters.

The fountains are three in number, and vary in temperature from 94° to 104° Fah.

Professor Smith obtained the following results from analyzing three quarts of the water:—

Muriate of lime and magnesia	4	grains.
Sulphate of magnesia	6	"
Sulphate of lime	41·05	"
Insoluble residue	2·05	"
Loss	1	"
	27·10	

Equal to 4·66 grains in a pint.

This water lies lightly upon the stomach, and is often used by visitors to the extent of three quarts, or even more, in the course of the day. In such doses, it is said to excite active purgation when first used, but after a few days it ceases to have any active effect.

As a *bath*, these waters have a wide and appropriate applicability. The bath of ninety-four de-

grees, will very generally be found safe and salutary for most persons. Those of higher temperature should be used with caution, and with a prudent reference to the nature of the disease and the state of the system at the time of their use. As stated when treating of the Hot Springs in Virginia, hot baths are potent and *positive* agents; they are revolutionary remedies, and, to be used safely and successfully, must be used with wise discrimination. They are unsuited to persons in ordinary health, and to all acute or subacute cases, but admirably suited to many cases of obstinate chronic diseases, especially to chronic rheumatism, palsy, and other cases depending upon obstinate obstructions and loss of vascular and nervous energy.

SHOCCO SPRINGS are situated nine miles from Warrenton, in Warren County. They are a mild sulphurous saline water. My valued friend, Dr. Howard, of Warrenton, informs me that they are "mildly *aperient* and actively *diuretic*, producing, after a few days' use, free bilious evacuations; and that they are advantageously employed in the various diseases for which mild sulphur waters are usually prescribed."

Shocco is improved by a large hotel and comfortable cabins, that will pleasantly accommodate four hundred persons.

JONES'S WHITE SULPHUR AND CHALYBEATE SPRINGS are located about five miles from Shocco, and eleven from Warrenton; they are improved for the accommodation of about three hundred and fifty visitors, and about that number may be found there at the height of the season.

The *White Sulphur* is a mild sulphurous saline water, and acts favorably in certain hepatic derangements, jaundice, dyspepsia, etc.

The *Chalybeate* is a strong ferruginous water; the *iron* is held in solution by carbonic acid. Dr. Howard considers it an excellent tonic, and "well suited for all those cases characterized by an enfeebled habit, and especially when the blood has been deprived of its normal proportion of iron. It displays marked efficacy in those whose blood has been robbed of this important element by malarious fevers; and in chlorosis, amenorrhœa," etc.

KITTRELL'S SPRINGS.—Immediately on the railroad from Weldon to Raleigh, in the County of Granville, and half a mile from the village of Henderson, *Kittrell's Springs* are found. They have attracted public notice only for the last two or three years, and as yet there is but little improvement at the place for the accommodation of visitors. The water of these springs has acquired considerable local reputation for the cure of various diseases, and particularly for scrofulous affections.

Chemical examinations have ascertained that the water holds in solution iron, magnesia, lime, alum, soda and potass.

These springs are probably destined to acquire a valuable medicinal reputation, and when properly improved, to become a place of considerable valetudinary resort.

SPRINGS OF SOUTH CAROLINA.

GLENN'S SPRINGS, in Spartansburg District, have considerable notoriety for their medicinal virtues.

Professor Shepard, of Charleston, states that the waters of these springs are strongly impregnated with sulphur, and that they also contain traces of sulph. magnesia, with sulphate, percarbonate, and chloride of lime.

These springs are much resorted to by the people of the lower country. Their situation is pleasant, salubrious and healthful, and their waters are highly esteemed by many, particularly in dyspeptic affections.

In the same district, and a few miles above the village of Spartansburg, there is a spring of some reputation and of some resort.

WEST'S SPRING is in the neighborhood of *Glenn's*. It is a chalybeate of good promise.

Chalybeate Springs are found in various parts of the State, particularly in Abbeville and Laurens Districts. In Laurens three or four chalybeate and sulphur fountains are known, that arise in the slate and hornblende formations that exist between the Ennoree and the Saluda, that are worthy of public attention.

I am indebted to Professor S. H. Dickson for the information, that the springs most visited in South Carolina, are Chick's Springs, in Greenville District, on the Ennoree River, just below the mountains, and Williamstown Springs, between Anderson and Greenville.

CHICK'S SPRINGS are two in number. One is slightly sulphurous, and is used for hepatic and intestinal affections and cutaneous disorders. The other is a mild chalybeate, and is employed as a tonic.

The WILLIAMSTOWN SPRINGS have never been analyzed, so far as I know. They are supposed to be both tonic and alterative.

A saline water obtained from an Artesian well in the City of Charleston, has some reputation. It contains chloride of sodium, or common salt, and the carbonate of soda. Many persons take it with great pleasure, and affirm that it relieves various derange-

ments of the stomach and bowels. Doctor Dickson further states, that horses are extremely fond of it, and that it is believed to act upon them beneficially, in promoting their ready fattening, and giving them a smooth and glossy coat. This water is said to be exported in bottles and sold in considerable quantities in the Northern cities.

SPRINGS OF GEORGIA.

The INDIAN SPRINGS, in the County of Butts, are *sulphurous waters*, and are considerably visited and much relied upon as remedial agents. They have been used with excellent effect in chronic rheumatism, and for various diseases of the liver and stomach.

The MADISON SPRINGS have long been regarded as a pure and excellent *chalybeate*. They are found in the County of Madison, and are much visited by those who desire the use of iron tonics.

The WARM SPRINGS are in the County of Merriwether. Their temperature is 95°. They have acquired considerable reputation for the cure of *rheumatism*, *gout*, and other chronic affections for which such waters are commonly employed.

They are all situated in pleasant and salubrious

districts, and so far elevated above the sea-board as to secure them against malarial influences.

GORDON'S SPRINGS, in the County of Murray, and ROWLAND'S SPRINGS, in the County of Cass, are *chalybeates*, and, within the last few years, are said to be attracting some attention from invalids.

CATOOSA SPRINGS are in the County of Catoosa, in the extreme western part of the State. They have not been analyzed, but are regarded as a saline chalybeate. They have been improved for the accommodation of several hundred persons, and are much visited during the watering season.

CHAPTER XLIII.

SPRINGS OF ALABAMA.

ALABAMA has several springs of decidedly marked properties, the most noted of which is

BLADEN SPRINGS, in the County of Clarke. These springs are within three miles of the Tombeckbee River, eighty-five from Mobile, and seven from Coffeeville. The country surrounding them is broken and hilly, and the growth of the forest is pine, hickory, oak, etc., and is well supplied with wholesome water.

The accommodations at the springs are sufficient for several hundred visitors.

Six fountains, differing slightly from each other, issue from the earth within a small compass, furnishing an abundant supply of water.

Professor Brumby, of the University of Alabama, has analyzed the Bladen waters,* and from a *wine* pint obtained the following results:—

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* We are indebted to Dr. Bell's work on *Mineral and Thermal Springs*, for many facts in reference to the springs of the extreme Southern States.

Sulphuretted hydrogen, quantity not ascertained.		
Carbonic acid gas	4 075	cubic inches.
Chloride of sodium	0·9625	"
Oxide of iron	0·0300	"
Sulphate of lime	0·0019	"
Crenic acid	0·0912	"
Loss	0·0400	"
Carbonate of soda	4·1112	"
" of lime	0·3437	"
" of magnesia	0·1706	"
Silica of alumina	0·2631	"
Apocrenic acid	0·0750	"

In various affections of the stomach, bowels and kidneys, as well as in chronic rheumatism, and diseases of the skin, the Bladen waters would prove valuable.

BAILEY'S SPRING is in Lauderdale County, nine miles from Florence, and fourteen from Tuscumbia. The water is cool, transparent, and essentially tasteless.

It has been chemically examined by Dr. Curry, of Knoxville, and is shown to contain sulphuretted hydrogen, carbonic acid, carbonates of soda and magnesia, oxide of iron in union with carbonic acid, carbonate of potash and chloride of sodium.

The composition of this water shows that it would prove valuable in the various functional disorders of the abdominal and pelvic organs, in mercurial diseases, and generally in chronic affections of the skin, as well as in rheumatism and gout.

Besides the springs before noticed, the TALLAHATTA SPRINGS are much visited by persons in that part of the State. These waters are said to contain sulphur, magnesia, lime, and the salts of iron.

SPRINGS OF MISSISSIPPI.

COOPER'S WELL is the most noted mineral fountain in Mississippi; it is in the County of Hinds, twelve miles west of Jackson, and four from Raymond, the shire town of the county, and near the Jackson Railroad.

The water rises in an Artesian well one hundred and seven feet deep, through solid sandstone rock. The surrounding country is broken and diversified, and is thought to be dry and salubrious. The water of this well is an active *saline chalybeate.*

An analysis of one gallon of the water gives in gaseous contents:—

Oxygen	6·5	cubic inches.
Nitrogen	4·5	"
Carbonic acid	4·0	"

Solid contents:—

Sulphate of soda	11·705	grains.
" of magnesia	23·280	"
" of lime	42·132	"
" of potash	0·608	"
" of alumina	6·120	"
Chloride of sodium	8·860	"

Chloride of calcium	4·322 grains.
" of magnesium	3·480 "
Peroxide of iron	3·352 "
Crenate of lime	0·311 "
Crenate of silica	1·801 "

The *deposit* obtained by evaporating the water, contains in one hundred grains:—

Water	38 grains.
Chloride of lime	2 "
Sulphate of lime	25 "
Peroxide of iron	35 "

This water is said to lose none of its qualities by being kept from the fountain.

The water of Cooper's Well enjoys a high reputation in dyspepsia and the various intestinal diseases of long standing; in liver complaints, chronic inflammation of the bladder, in dropsy, and especially in chronic diarrhœa. Its analysis shows that it is a medicinal agent of very decided powers.

The OCEAN SPRINGS are situated in the pine hills of Jackson County, five miles from the town of Biloxi, half a mile from Biloxi Bay, and near Fort Bayou.

One gallon of this water has in gaseous contents:—

Carbonic acid	4·632 grains.
Sulphuretted hydrogen	0·481 "

In solid contents:—

Chloride of sodium	47·770 grains.
" of calcium	3·882 "
" of magnesium	4·989 "
Protoxide of iron	4·712 "

With *traces* of iodine, organic matter, chloride of potassium and alumina.

Dr. Bell, in quoting Dr. J. Laurence Smith, remarks, that the iron is doubtless in combination with both the sulphuretted hydrogen and carbonic acid gases; the excess of carbonic acid holding both these combinations in solution.

Dr. Austin, of New Orleans, in a letter to Dr. Bell, states that striking cures have been wrought by these waters in many chronic diseases; among them are affections of the skin, scrofula, dyspepsia, and strumous ophthalmia.

The Ocean Springs are very easy of approach both from New Orleans and Mobile, being about ninety miles distant from both places.

SPRINGS OF ARKANSAS.

THE WASHITA HOT SPRINGS are near the Washita River, in Hot Spring County. They arise near the base of a mountain called Hot Spring Mountain.

The streams of hot water are numerous, and their temperature, according to "Schoolcraft" and Judge Watts, varies from 145° to 200° Fah.

These waters are used internally as well as externally, and possess valuable therapeutic powers. They are employed externally both in the form of vapor and hot water baths, by cooling down the water to the desired temperature. They have not been critically analyzed, but are believed to contain magnesia and salts of lime, with an azotized or organic substance.

The curative powers of these springs are greatly praised by many who have used their waters in various chronic affections, particularly in rheumatism, gout, scrofula, diseases of the skin, mercurial disease, and secondary lues.

These springs are the best representatives we have in the Atlantic States of the European waters of Baden-Baden, Wisbaden, Carlsbad, and Teplitz in Bohemia.

There is an *Iron Spring* a few miles from the Hot Springs, that is said to be a valuable water of its class.

The Washita Springs are improved for the comfortable accommodation of about 600 persons.

CHAPTER XLIV.

THERMAL SPRINGS OF AMERICA.

We have thought that it would be interesting to our readers to have a condensed view of the various *Thermal* Springs of the United States and its Territories.

Virginia is rich in thermal waters, and up to the time of the discovery of the numerous Hot Springs of New Mexico, was regarded as possessing more of this class of waters than any other portion of the Continent.

We shall first notice the thermal waters of Virginia, and shall regard all the springs as belonging to that class whose waters are distinctly above the mean temperature of the immediate country in which they arise. In this class we include the Greenbrier White Sulphur, although not generally regarded as a thermal spring; but the fact that it is full ten degrees above the main temperature of the atmosphere and the neighboring fountains, properly gives to it this character.

	Fahrenheit.
White Sulphur, Virginia*	62°
Holstein Springs, Scott County, Virginia	68°
Bath, Berkeley County, Virginia	73°
Sweet Springs, Monroe County, Virginia	73 to 74°
Red Sweet, Alleghany County, Virginia	75 to 79°
Healing Spring, Bath County, Virginia	84°
Warm Springs, " "	98°
Hot Springs, " "	98 to 106°
Perry County, Pennsylvania	72°
Lebanon, New York	73°
Merriwether County, Georgia	95°
Buncombe County, North Carolina	94 to 104°
Warm Springs on the French Broad, Tennessee	95
Florida Sulphur Springs	70°
Washita, Arkansas	140 to 156°
Spring near Fort Laramie, Nebraska	74°
Hot Sulphur Springs, California	187°
Hot Springs at Shasty's Peak, California	—
Great Salt Lake City Warm Spring	—
Great Salt Lake Hot Springs, Utah	123°
Great Salt Lake Hot Chalybeate, thirty miles from Great Salt Lake	132 to 136°
Great Salt Lake Thermal Saline	74 to 84°
Great Salt Lake Spring Valley Saline	70 to 74°
Bear River Warm and Hot Springs, seventy-four miles northwest from Salt Lake City	134°
Lake Utah Warm Springs	—
Hot Springs, Oregon	164°
Malheur River Hot Springs, Oregon	193°
Hot and Warm Springs, Fall River, Oregon	89 to 134°
Hot Springs, Pyramid Lake, Utah†	206 to 208°

* Professor Rogers expresses the opinion that a large portion of the springs issuing from the great Apalachian range of mountains, and especially those of the great Shenandoah Valley of Virginia, are slightly thermal.

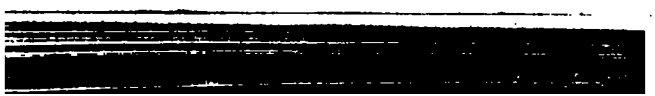
† Mineral and Thermal Springs of the United States, by Bell.

The Pyramid Lake, embosomed in the Sierra Nevada Mountains, with its singular pyramidal mount rising from its transparent waters to the height of about six hundred feet, and walled in by almost perpendicular precipices, in some places nearly three thousand feet high, is a remarkable formation, and is said to have nothing to resemble it in the States. Its boiling springs have attracted the attention of the scientific. Colonel Fremont describes them in about one hundred and seventeen degrees thirty minutes west longitude, and thirty-nine degrees north latitude, as boiling up at irregular intervals with much noise. He states that the largest basin is several hundred feet in circumference, and has a circular space at one end of fifteen feet in diameter, entirely filled with boiling water, whose temperature near the edge, is two hundred and six degrees. Its depth near the centre is more than sixteen feet.

The late Captain Gunnison, speaking of these springs, says: "At the base of the hills around the lake, issue numerous *warm springs*, that collect in pools and smaller lakes, inviting aquatic fowl, during the winter, to resort to their agreeable temperature, and where insect larvæ furnish food at all times; and the soil is so heated that snow cannot lie in the vicinity. In some places springs of different temperature are in close proximity; some so hot that the hand cannot be thrust into them without pain."

Near the Bear River is a depression, in which issue three fountains between the strata, within a space of thirty feet, of which one is Hot Sulphur, the next tepid and salt, and the uppermost, cool, delicious drinking water. The three currents unite, and flow off through the plain, forming the beginning of a large and bold river. There are also warm breathing, or gas-emitting fountains, *chalybeate* and *gypsum* springs of high and low temperature.

THE END.



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